Vol. 891 Number 2

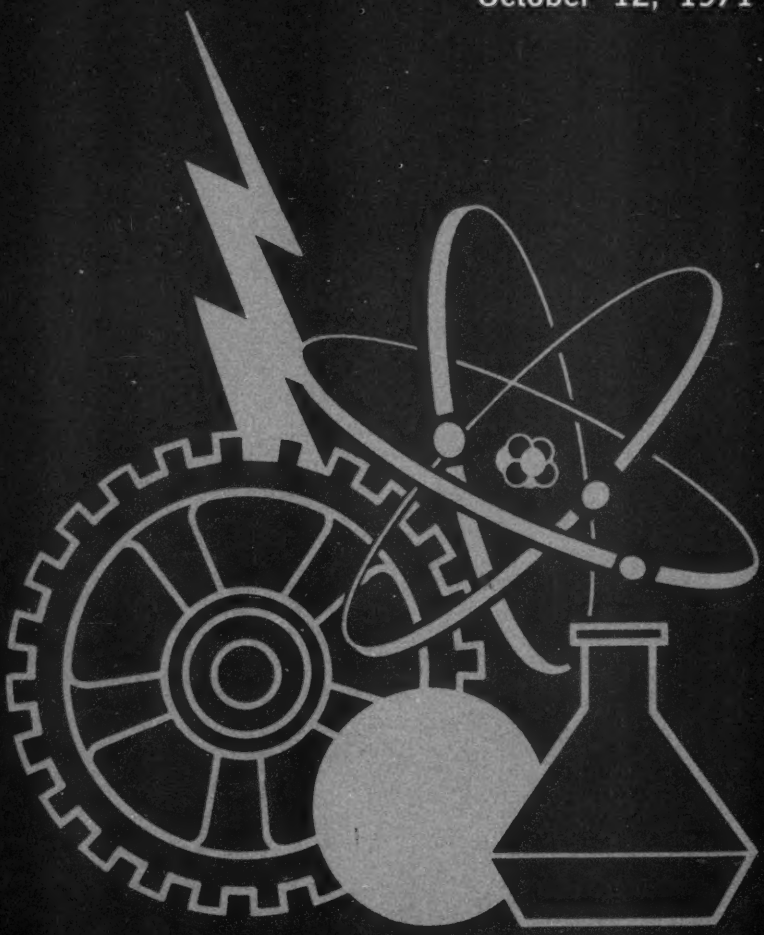
OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

October 12, 1971



U. S. DEPARTMENT OF COMMERCE

Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

October 12, 1971 Volume 891 Number 2

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PATENT OFFICE NOTICES

Certificates of Correction for the Week of Oct. 12, 1971

3,288,673	3,550,059	3,573,968	3,579,538
3,405,156	3,557,291	3,574,196	3,579,561
3,421,133	3,557,417	3,574,534	3,580,707
3,459,804	3,560,392	3,575,080	3,580,970
3,474,052	3,561,262	3,576,651	3,581,087
3,483,197	3,562,709	3,576,652	3,581,275
3,509,985	3,563,590	3,576,973	3,581,345
3,511,862	3,563,961	3,577,190	3,581,576
3,520,872	3,564,097	3,577,270	3,581,717
3,525,520	3,565,260	3,577,511	3,581,740
3,531,425	3,567,377	3,578,653	3,582,769
3,534,286	3,570,407	3,578,955	3,582,812
3,538,680	3,572,854	3,579,082	3,585,012
3,540,565	3,572,983	3,579,485	3,588,915
3,542,652	3,573,090		

Erratum

All references to Patent Number 3,607,061 to John C. Angus, for Manufacture of Synthetic Diamonds, appearing in the OFFICIAL GAZETTE of September 21, 1971 should be deleted as the application was withdrawn from issue and the patent was not issued.

Notice of Daylight Saving Time

Attention is called to the notice published in 885 O.G. 424, April 20, 1971, as to the operation of the Patent Office on Daylight Saving Time. This operation will terminate on October 31, 1971.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 21, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-08-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Potsons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	3-18-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-03-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-17-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-24-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	1-08-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-31-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-24-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-21-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	7-22-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	9-29-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	7-13-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	6-03-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-11-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	9-14-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	8-05-70

Expiration of patents: The patents within the range of numbers indicated below expire during October 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,690,560 to 2,692,986, inclusive
Plant Patents..... Numbers 1,312 to 1,327, inclusive

REISSUES

OCTOBER 12, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,183

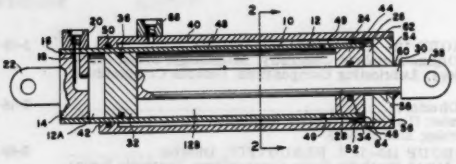
CYLINDER CONSTRUCTION

Borje O. Rosaen, 4031 Thornoaks Drive, Ann Arbor, Mich. 48104

Original No. 3,335,642, dated Aug. 15, 1967, Ser. No. 424,281, Jan. 8, 1965. Application for reissue July 15, 1969, Ser. No. 853,557

Int. Cl. F01b *31/00*

U.S. Cl. 92—110 14 Claims



A first fluid cylinder comprising inner and outer tubular members, telescopically joined for relative movement between extended and retracted positions, having a first pressure chamber formed within the inner tubular member, and a second pressure chamber formed within the radial spacing between the inner and outer tubular members. A piston having a rod extending from one side thereof is slidably mounted within the first pressure chamber in such a manner as to cause relative extension of the inner and outer tubular members when the piston side opposite the one piston side having the rod extending therefrom is exposed to fluid, and relative retraction when the one piston side having the rod extending therefrom and the second pressure chamber are both exposed to fluid. The second chamber having a fluid actuated member, the pressure responsive area of which is substantially equal to the transverse cross sectional area of the rod, while the sum of the pressure responsive areas of the fluid actuated member and the one piston side having the rod extending therefrom is substantially equal to the pressure responsive area of the opposite piston side.

27,184

APPARATUS FOR AUTOMATIC PRODUCTION OF GRAMOPHONE RECORDS

Walter Leslie Rand, Gerrards, and Leslie Eric Zouch, Hays, England, assignors to Electric & Musical Industries Limited, Middlesex, England

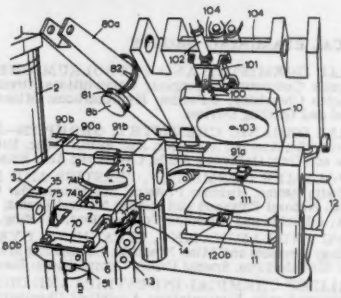
Original No. 3,329,997, dated July 11, 1967, Ser. No. 574,478, Mar. 8, 1966, which is a division of Ser. No. 229,332, Oct. 9, 1962. Application for reissue July 3, 1969, Ser. No. 848,368

Claims priority, application Great Britain, Oct. 11, 1961, 36,423/61

Int. Cl. B29d *17/00*

U.S. Cl. 18—5.3 P 7 Claims

The invention relates to a machine for producing gramophone records, the machine comprising a moulding press including two mould supports and means for repetitively moving the mould supports together and then apart to press gramophone records. At one side of the press there is located means for repetitively producing a shot of mouldable material sufficient to form a gramophone record and having two labels adhering respectively to the upper and lower surfaces of the shot. A reciprocating shot loader transfers each shot and the adhering labels to the press while the mould supports are apart, the shot loader being withdrawn before the mould supports are moved together to press the respective record. The shot



loader supports the shot by means of suction applied to one of the labels. Pairs of grippers are provided on two endless bands located at the front and rear of the press and these bands are moved intermittently so that a pair of grippers is located in a position to seize the flash of a record as it is moulded in the press. When the press is opened, the bands are moved to transfer the record from the press to a record processing tool, located at the other side of the press from the means for producing the shot.

27,185

PHOTOCELL POSITION DETECTOR FOR ELEVATOR CARS INCLUDING A PERFORATED TAPE UNIQUELY ENCODED FOR EACH POSITION WITH RESPONSIVE CONTROL MEANS

William Henry Bruns, deceased, late of Lincolndale, Somers, N.Y., by Eva C. Bruns, executrix, De Bary, Fla., and Lew H. Diamond, Massapequa, and Herbert Jacoby, Jamaica, N.Y., assignors to Otis Elevator Company, New York, N.Y.

Original No. 3,414,088, dated Dec. 3, 1968, Ser. No. 154,132, Nov. 22, 1961. Application for reissue June 6, 1969, Ser. No. 844,219

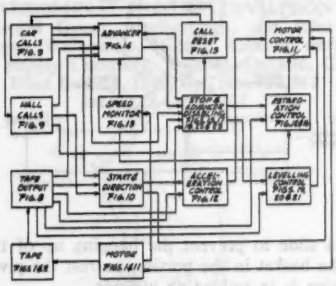
Int. Cl. B66b *1/16*

U.S. Cl. 187—29 R 42 Claims

This application concerns an elevator system which eliminates most of the maintenance problems associated with prior systems. Virtually trouble free logic circuit elements composed of static-type electronic and solid state elements are substituted for primarily all the mechanical and electro-mechanical devices which were used in earlier systems.

In one of the disclosed embodiments a tape is driven over a sheave by the elevator car to duplicate its movement. This tape is slotted to form rows of slots at various

points along its length in accordance with a binary code so that each point corresponds to a predetermined position in the hoistway and the code in each row identifies its corresponding position. As the car moves through the hoistway, the code, associated with each of the various positions it passes, is converted into electrical output signals by


CAR CALLS FIG. 9
ADVANCE FIG. 14
CALL RESET FIG. 13
MOTOR CONTROL FIG. 11
HALL CALLS FIG. 9
SPEED MONITOR FIG. 13
RETARDATION CONTROL FIG. 15
TAPE OUTPUT FIG. 8
STARTS DIRECTION FIG. 10
ACCELERATION CONTROL FIG. 12
LEVELLING CONTROL FIGS. 7, 8, 16 & 17
TAPE FIGS. 16 & 18
MOTOR FIGS. 16 & 11

means of a light source and photocell translator. This provides information concerning the location of the car. This information in conjunction with that concerning the speed of the car as provided by signals derived from a tachometer generator is applied to various electronic tube and solid state circuits which perform the essential logic functions necessary to control the operation of the car.

27,186

STEEL SHELVING

Irwin J. Ferdinand, Glencoe, and Dale Raymond Lopatka, Lake Zurich, Ill., assignors to Hirsch Company

Original No. 3,255,722, dated June 4, 1966, Ser. No. 308,533, Sept. 12, 1963. Application for reissue Jan. 21, 1970, Ser. No. 10,666

Int. Cl. A47b *9/00*

U.S. Cl. 108—144 **35 Claims**

A knock-down metal shelving assembly is disclosed characterized in one embodiment by sheet metal shelves having depending peripheral opposing side flanges and end flanges which terminate in sharply square end edges at the cut-out corners to provide recessed openings to receive support columns with side portions that engage flat against the opening and a securing clip is disclosed with a centrally apertured wall that spans each corner, engages the flanges through tabs at spaced bearing points to hold the shelves to the support columns with the side flanges held endwise against the columns in a stress squaring relationship in cooperation with releasable securing means between the apertured wall and the support column. Other embodiments are disclosed.

27,187

PRINTED CIRCUIT MULTI-LAYER WINDING FOR ELECTRIC ROTARY MACHINES

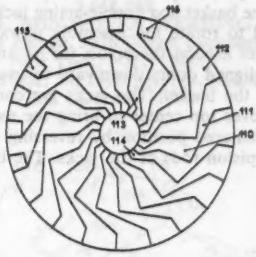
Jacques Henry-Baudot, Antony, France, assignor to Photocircuits Corporation, Glen Cove, N.Y.

Original No. 3,296,474, dated Jan. 3, 1967, Ser. No. 300,287, Aug. 6, 1963. Application for reissue Feb. 16, 1965, Ser. No. 723,633

Claims priority, application France, Sept. 20, 1962, 909,988

Int. Cl. H02k *1/22*

U.S. Cl. 310—268 **3 Claims**



An electrical rotating machine is disclosed having a printed circuit armature winding made up of two or a multiple of two layers, the conductors in alternate layers being reversely oriented and all conductors being interconnected to form a single uninterrupted series-wave winding.

27,188

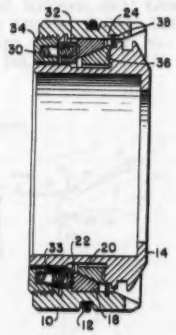
SLIPPING CONE SEAL

Werner Pustelnik, Laudong, Austria, assignor to Avco Corporation, Stratford, Conn.

Original No. 3,502,343, dated Mar. 24, 1970, Ser. No. 710,305, Mar. 4, 1968. Application for reissue June 25, 1970, Ser. No. 49,676

Int. Cl. F16j *15/16*; F16k *41/00*

U.S. Cl. 277—25 **5 Claims**



A seal comprises two concentric piston rings having contacting complementary conical surfaces. The piston rings are axially spring biased. The outer piston ring is split. An axial spring force is translated into axial and radial components, the radial component resulting from the relative movement between the adjacent conical surfaces. The seal is effective at zero speeds and has increased effectiveness due to centrifugal force at operating speeds.

27,189

AUTOMATIC UNLOADING WASHING MACHINE

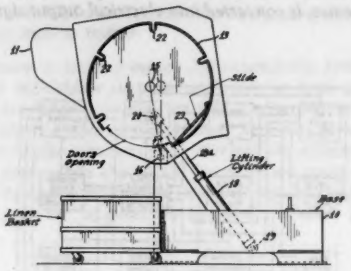
Martin Hutterer, Forest Hills, N.Y., assignor to Cummings-Landau Laundry Machinery Co., Inc., Brooklyn, N.Y.

Original No. 3,417,583, dated Dec. 24, 1968, Ser. No. 634,247, Apr. 27, 1967. Application for reissue Feb. 2, 1970, Ser. No. 15,378

Int. Cl. D06f *37/06*

U.S. Cl. 68—210 7 Claims

A self-unloading laundry machine of the commercial type, including a horizontal axis, rotary basket in a watertight housing with aligned access doors in a portion of the top half of each for loading and unloading. The entire machine including its driving motors is carried by a frame mounted on pivots spaced forwardly from the axis of rotation of the basket and double-acting jacks and controls are provided to rotate the assembly upwardly at predetermined rates around the pivots for an angular distance to aim the aligned doors downward to cause the load to drop out of the basket. The jacks are controlled as the unit moves over top center to bring the assembly to rest at an over-centered position by reversing the forces applied to the piston rods of the jacks. The basket includes access doors and, internally, a flat surface extending across a chord of the circle from the edge of the access door opening to a point part way around the circle, thereby



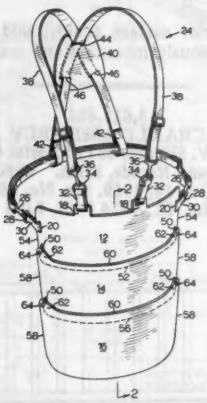
forming a slide to prevent the hanging up of the work load in the basket in the portion nearest the pivot when the machine is in unloading attitude.

PATENTS

GRANTED OCTOBER 12, 1971

GENERAL AND MECHANICAL

3,611,438
ABDOMINAL PROTECTION APRON
John Edward Gregg, Scarborough, and John Nelson Brannigan, Willowdale, Ontario, Canada, assignors to Safety Supply Company, Toronto, Ontario, Canada
Filed Dec. 19, 1969, Ser. No. 886,561
Int. Cl. A41d *13/04*
U.S. Cl. 2—51 **6 Claims**

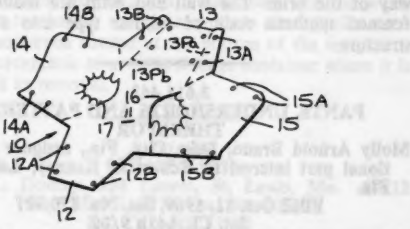


An abdominal protection apron of the type which is worn about the abdomen to protect against knife wounds and the like comprising at least two transversely disposed arcuate shaped segments which are integrally connected to one another. Each of the segments consists of a sheet of substantially rigid puncture-resistant material having a curvature loosely conforming to the curvature of the human abdomen. The two segments are pivotably connected to one another to permit the wearer to bend forward when the apron is in use. A supporting means is secured to the apron for positioning it in a position overlying the abdomen of the wearer.

3,611,439
NURSING GOWN
Phyllis L. Meyers, 5235 Linwood Drive, Los Angeles, Calif. 90027
Filed Apr. 22, 1970, Ser. No. 30,844
Int. Cl. A41d *1/20*
U.S. Cl. 2—74 **4 Claims**

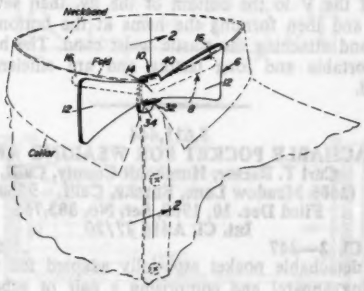
A gown for use by nursing mothers. The gown includes a pair of breast-covering panels, either one of which may be selectively dropped to permit breast feeding. When the panels are in a dropped position, the gown is supported from the wearer's shoulders by straps which extend downwardly on either side of the wearer's breasts to the portion of the gown below the breast area.

3,611,440
EXPENDABLE NON-WOVEN WEARING APPAREL
Sophie Zamist, 3010 Grand Concourse, New York, N.Y. 10458
Filed Apr. 24, 1970, Ser. No. 31,532
Int. Cl. A41d *11/00*
U.S. Cl. 2—80 **6 Claims**



Expendable wearing apparel formed of two-dimensional blanks preferably of non-woven fabric material, the blanks having a cruciform profile to define a crotch portion as well as fly, seat and side flaps extending therefrom. The crotch portion is provided with expandable leg holes, whereas the flaps have complementary apertures therein to receive fasteners, the apertures being so placed that when the flaps are raised about the wearer, the fly and seat flaps may be connected to the side flaps to define short pants, a romper or a similar article of apparel.

3,611,441
PLASTIC BOW TIE
Earl M. Kitchen, 4911 Granada, Los Angeles, Calif. 90042
Filed Apr. 8, 1970, Ser. No. 26,712
Int. Cl. A43d *25/08*
U.S. Cl. 2—154 **6 Claims**



A one piece stamped out plastic form delineated so that the pre-shaped normally flat component parts can be bent and fashioned into a bow tie; an adaptation which lends itself to use by waiters, bus boys, restaurant assistants, and also temporarily for festive parading and

campaign display purposes. It is readily bendable to provide an imitation bow tie, a V-shaped positioning and steadying adapter and neckband hooking and retaining clip.

3,611,442
SHAMPOO HAT
Seiichi Yazaki, Sakai, Japan, assignor to The Fujimoto Company Limited, Osaka, Japan
Filed Dec. 31, 1969, Ser. No. 889,645
Int. Cl. A42b 1/02
U.S. Cl. 2—174 6 Claims

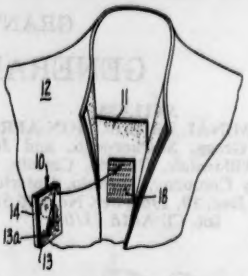
A shampoo hat having a generally annular upstanding wall of a suitable height defining the central hole enabling it to be placed upon the head of an infant or other user. A brim formed integrally with the wall includes alternate ridges and grooves which extend radially from the base portion of the wall, and in one form extend only to midway of the brim. The wall and brim are molded of a foamed synthetic resin of cellular type into a unitary structure.

3,611,443
PANTS, UNDERSHORTS AND PATTERNS THEREFOR
Molly Arnold Braun, Lake City, Fla., assignor of fractional part interest to Robert L. Kenney, Lake City, Fla.
Filed Oct. 21, 1969, Ser. No. 870,397
Int. Cl. A41b 9/02
U.S. Cl. 2—224 R 3 Claims

Briefs made of one piece with the seams near the outside of the crotch area. The pattern has a generally V shaped cut in the bottom middle, with the angle of separation diminishing near the separated end of the V. The pattern is cut away and removed between the merging end of the V and about the middle of the width of the V. The outside margins of the pattern are cut in three straight lines of lengths, angles and relative positions generally matching the corresponding cuts at the V. The briefs are made by forming the fly, then sewing the center of the V to the bottom of the fly, then sewing the legs, and then forming the hems at the bottom of the legs and attaching the elastic waist band. The briefs are comfortable and long lasting and are efficiently produced.

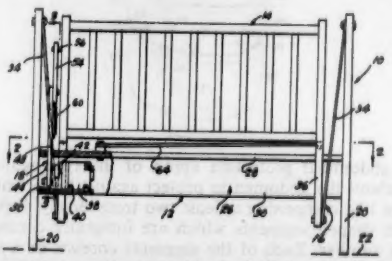
3,611,444
DETACHABLE POCKET FOR WEARING APPAREL
Carl T. Rector, Humboldt County, Calif.
(2408 Meadow Lane, Eureka, Calif. 95501)
Filed Dec. 10, 1969, Ser. No. 883,766
Int. Cl. A41d 27/20
U.S. Cl. 2—247 6 Claims

A detachable pocket especially adapted for use with wearing apparel and comprising a pair of substantially parallel side panels peripherally joined with a substantially continuous seam and having a slit formed through one side panel, the slit providing access into the pocket, said one side having an exterior woolly surface; and means for mounting said pocket comprising a hooked fabric secured to the article of wearing apparel; whereby an object may be inserted through the slit into said pocket and the pocket attached to the hooked fabric by placing the



woolly and exterior surface against said hooked fabric, thereby simultaneously mounting and sealing the pocket.

3,611,445
CRADLE ASSEMBLY
Wayne L. V. Hillard, 2911 Charles Gate SW., Grand Rapids, Mich. 49509
Filed Oct. 14, 1969, Ser. No. 866,276
Int. Cl. A47d 9/02, 9/04
U.S. Cl. 5—109 6 Claims

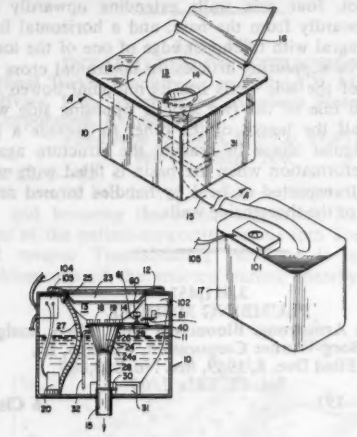


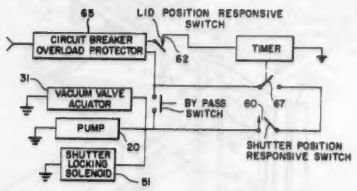
A rocking cradle assembly including a main upright frame suspending a cradle for lateral movement in a plane parallel to a support surface. An electric motor imparts reciprocating motion to the cradle through an eccentric cam and linkage. The linkage is disposed between the cam and cradle, and consists of a pair of overlapped, pivotally connected links normally prevented from moving relative to each other by a tensioned coil spring having an end connected to each link. The motor rotates the cam which oscillates the links in unison, which, in turn, imparts motion to the cradle. If the cradle is manually immobilized, one link oscillates and pivots relative to the other, enabling the motor to continue to operate and the cradle to dwell, without any detrimental effects to the drive system. This motion occurs to a lesser extent at the end of each reciprocal stroke of the cradle, thereby cushioning the reciprocal motion of the cradle at the end of each stroke and providing a smooth, gentle rocking effect.

3,611,446
SANITARY VEHICLE CLOSET
Durrell U. Howard, 306 Krameria Drive, San Antonio, Tex. 78213
Filed May 28, 1970, Ser. No. 41,174
Int. Cl. E03d 1/00, 3/00, 5/00
U.S. Cl. 4—10 10 Claims

A sanitary closet equipped with a receptacle holding means for positioning a disposable receptacle below the bottom outlet of the closet bowl. The disposable receptacle is removed after each use through a conduit by creating a vacuum in a waste storage reservoir disposed below the bowl. A flushing fluid reservoir provides a

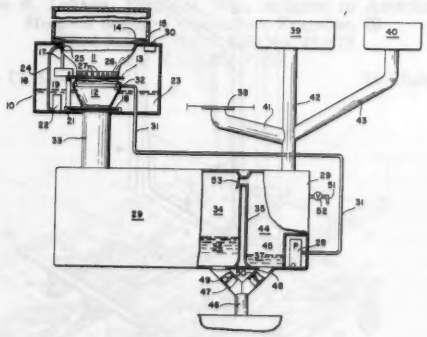
supply of flushing fluid for cleaning the bowl after each use; however, during the flushing cycle, communication between the bowl and the waste storage receptacle is



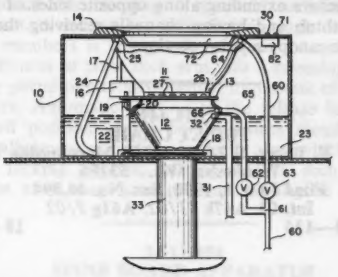


blocked so that the flushing fluid path bypasses the receptacle and cannot become contaminated by its contents.

3,611,447
SANITARY CLOSET
Durrell U. Howard, 306 Krameria Drive, San Antonio, Tex. 78213
Filed May 28, 1970, Ser. No. 41,427
Int. Cl. E03d *1/00, 3/00, 5/00*
U.S. Cl. 4—10 **8 Claims**

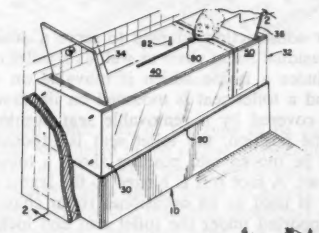


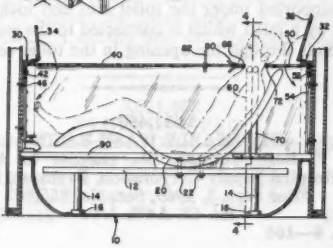
A sanitary system for vehicles or the like includes a sanitary closet having a bowl and a temporary storage receptacle for waste which is positioned below the bowl. Both bowl and receptacle are provided with a respective bottom shutter element which is selectively operable between opened and closed positions. An operating means for the shutters ensures that only one of the two shutters can be open at any one time, with the shutter at the bottom of the bowl being open during use of the closet and closed during the flushing cycle. The bowl is flushed from a reservoir of flushing fluid, and the flushing fluid follows a path which returns the fluid from the bowl, whose shutter is now closed, to the reservoir, bypassing the lower temporary storage receptacle. The receptacle may be concurrently flushed by flushing water obtained

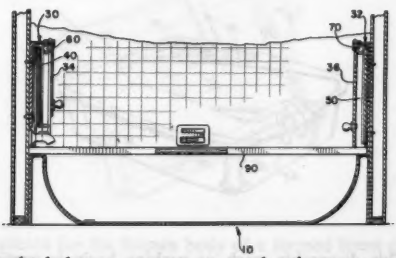


from a storage container which collects waste water from sinks, showers, etc., and this water flows with the waste from the temporary storage receptacle through the associated, now-open shutter at the bottom of the temporary storage receptacle to a waste storage container where it is held until its removal.

3,611,448
STEAM BATH
Eddie L. Dudley, 934 Laurel, St. Louis, Mo. 63112
Filed May 1, 1970, Ser. No. 33,551
Int. Cl. A61h *33/12*
U.S. Cl. 4—162 **10 Claims**



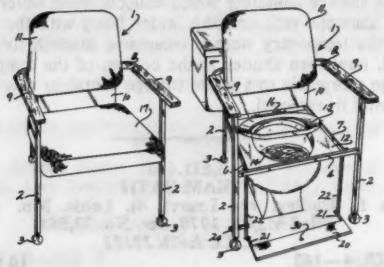




A bathtub has a support means therein to support a person above the bottom of the tub. A canopy means includes a pair of flexible canopy portions, and a pair of

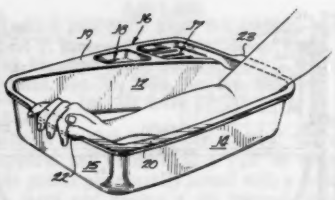
casings are disposed adjacent opposite ends of the bathtub. One end of each of the canopy portions fixed in position within the confines of one of said casings, the other end of each of said canopy portions being secured to one of a pair of movable canopy support portions which are slidably guided in their movement by a pair of elongated guide members extending along opposite sides of the top of the bathtub and having channels receiving the lower ends of the canopy support portions.

3,611,449
TOILET CHAIR
Kenneth E. Berry, S 24 W 22769 Morningside Drive, Waukesha, Wis. 53186
Filed June 8, 1970, Ser. No. 44,094
Int. Cl. A47k *11/02*; A61g *7/02*
U.S. Cl. 4—134 **10 Claims**



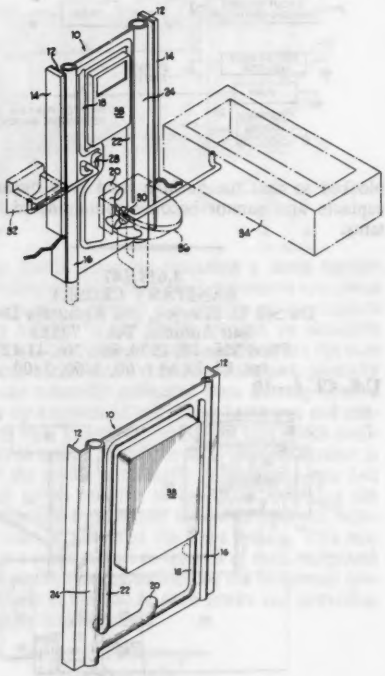
A chair construction adapted to serve a dual function as an occasional room chair as well as a toilet chair. The chair includes a frame which is movable on wheels or casters and a toilet seat is mounted on the frame and is normally covered by a removable seat cushion. By removing the cushion, the toilet seat is exposed and the chair can be moved into position above a toilet bowl or water closet. A foot rest is hinged to the frame and when the chair is used as an occasional room chair, the foot rest is supported under the toilet seat and locked in this position by a latch which is connected to the seat cushion and extends through the opening in the toilet seat.

3,611,450
DISPOSABLE WASH BASIN
Lewis F. Bost, Chicago, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Sept. 5, 1969, Ser. No. 855,562
Int. Cl. A47k *1/04*
U.S. Cl. 4—166 **4 Claims**



This disposable wash or soaking basin is particularly suitable for patient use. The basin is durable enough for repeated use yet inexpensive enough to be discarded after use by a patient, if so desired. The solid, integrally-molded plastic basin includes a generally flat supporting base elongated in one direction sufficient to accommodate a forearm or foot, four side walls extending upwardly and slightly outwardly from the base, and a horizontal ledge or shelf integral with the upper edge of one of the longer side walls for supporting articles. In horizontal cross section, each of the side walls has its midpoint bowed outwardly; and one of the two shorter opposing side walls is about half the length of the other to provide a generally triangular shape in bracing the structure against diagonal deformation when the basin is filled with water and being transported or held by handles formed at the upper edge of the shorter side walls.

3,611,451
PLUMBING MODULE
William H. Armstrong, Bloomfield Hills, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Dec. 8, 1969, Ser. No. 883,085
Int. Cl. E03c *1/00*
U.S. Cl. 4—191 **6 Claims**



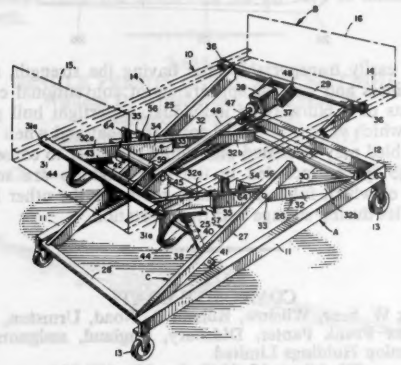
A prefabricated plumbing module or assembly which is an integral molded unit adapted to be installed between studding or other wall constructions of a building or the like and having interconnected piping for connection with the waste and drain fittings of a water closet bowl, a lavatory and a bath tub or shower (or combination thereof) and for connection with a vent and stack and to a waste system or sewer. The water closet tank can be integrally molded in the unit.

ERRATUM

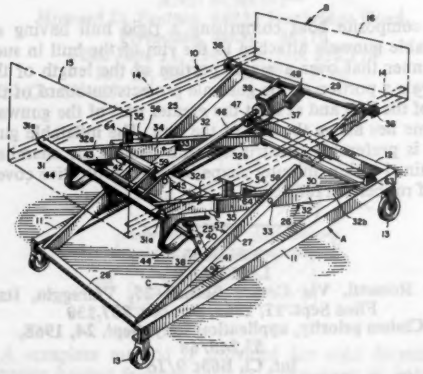
For Class 4—134 see:
Patent No. 3,611,457

3,611,452
INVALID BED CONSTRUCTION
Michael Turko, Manitowoc, and Floyd F. Mueller, Two Rivers, Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed June 25, 1970, Ser. No. 49,672
Int. Cl. A61g 7/00
U.S. Cl. 5—62 **36 Claims**

An invalid bed having a scissors mechanism for raising and lowering the patient-supporting frame. Movement of the patient-supporting frame into Trendelenburg and reverse Trendelenburg positions is achieved by buckling one of the scissors frames, thereby permitting the upper end of that frame to be positioned below or above the corresponding end of the other scissors frame. Power drive, coupled with a lever and cam arrangement, produces substantially constant-speed lifting and lowering action of the patient-supporting frame regardless of the particular elevation of that frame.

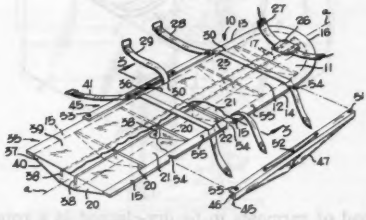


3,611,453
INVALID BED AND TILT ACTUATING MECHANISM
Gene B. Lokken, Mishicot, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed June 25, 1970, Ser. No. 49,673
Int. Cl. A61g 7/00
U.S. Cl. 5—62 **26 Claims**



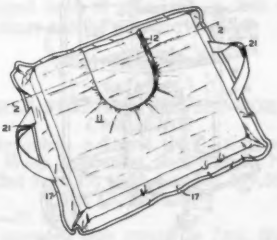
An invalid bed in which movement of a patient-supporting frame into Trendelenburg and reverse Trendelenburg positions is achieved by buckling one of the scissors or connecting frames upon which the patient-supporting frame rests. Buckling of such connecting frame is normally prevented by at least one butterfly arm pivotally carried by one of the longitudinal members of such frame, the arm normally engaging the end of the frame's other longitudinal side member to maintain such members in alignment. A release bar extending through one of such frame members is engageable with an extension of the butterfly arm to pivot such arm into a releasing position, thereby permitting relative pivotal movement of the frame members. Automatic shifting of the release bar into its retracted position occurs as the frame members pivot out of alignment so that the butterfly arm, which is biased into a locking position, will again lock such members together when they have returned to aligned condition.

3,611,454
SPINE BOARD APPARATUS
Allen P. Klippel, 7112 Wydown Blvd., Clayton, Mo. 63105
Continuation-in-part of application Ser. No. 793,514, June 23, 1969. This application June 24, 1970, Ser. No. 49,359
Int. Cl. A61g 7/10
U.S. Cl. 5—82 **5 Claims**



Spine board apparatus, of the type to be carried, dismantled, and assembled in the course of rescuing fracture patients. The board construction is lightweight, being reinforced inwardly from center edges to deeper centerline beams. Edge channels with truss reinforcements serve with the beams to support the board when it is assembled, and permit hoisting. Latching pins are pre-positioned on the channels.

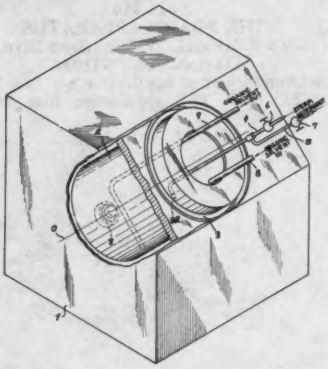
3,611,455
FLOTATION PAD
Max Gottfried, Rossford, Ohio, assignor to The Jobst Institute, Inc., Toledo, Ohio
Filed Apr. 29, 1969, Ser. No. 820,085
Int. Cl. A47c 27/08; A47g 9/00
U.S. Cl. 5—348 **6 Claims**



A cushion for the human body of a formed foam elastomer enclosed in a fluid impervious flexible envelope from which the air has been removed and at least in part replaced by a liquid such as water. The foam essentially

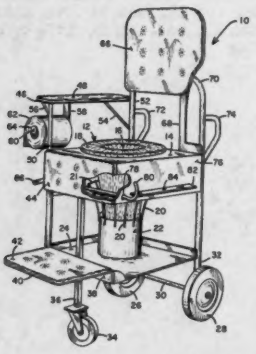
is saturated with the liquid and the envelope loosely encloses the elastomer form so that the envelope conforms to a supported body, the liquid tends to equalize the supporting pressure across the surface of the body and the elastomer form tends to confine the body of liquid to the support area and provide a stable support.

3,611,456
METHOD OF AND APPARATUS FOR SPOTTING TEXTILES BEFORE DRY CLEANING
Horst Hildebrandt, Rheydt, Rhineland, Germany, assignor to BOWE, Bohler & Weber KG, Augsburg, Germany
Filed Feb. 20, 1970, Ser. No. 13,083
Claims priority, application Germany, Feb. 20, 1969, P 19 08 506.4
Int. Cl. D06f *35/00, 43/02*
U.S. Cl. 8—149.1 **5 Claims**



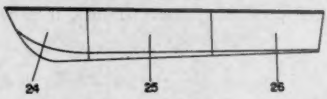
A load of garments to be dry-cleaned in a rotating or oscillating drum is subjected in that drum, in the absence of organic cleaning fluid, to a mixture of steam and detergent to moisten and lift major stains of a water-soluble nature; after tumbling for a certain period in this atmosphere, the moist garments are treated with the usual organic solvent.

3,611,457
PORTABLE SANITARY TOILET
Louis C. Wippich, Sauk Rapids, Minn. 56379
Filed June 12, 1970, Ser. No. 45,615
Int. Cl. A47k *11/04*; A61g *9/00*
U.S. Cl. 4—134 **10 Claims**



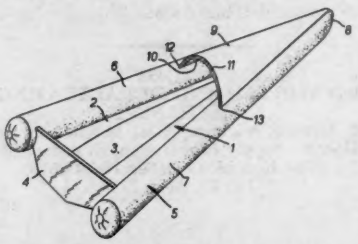
This invention relates to a portable sanitary toilet cart for use in hospitals, institutions, nursing homes, and the like. A wheeled cart is provided with a footrest portion, a back portion, and a waste receptacle portion. A clamping mechanism is shown for clamping the portable sanitary toilet cart to the side-rail of a bed. A removeable waste receptacle is also shown.

3,611,458
BOAT CONSTRUCTION
Alvaro Rodriguez Gonzalez, Urbanizacion San Martin, Bloque 4, Apto. E-6, Caracas, Venezuela
Filed Sept. 3, 1969, Ser. No. 854,828
Claims priority, application Spain, Sept. 3, 1968, 357,796
Int. Cl. B63b *7/04*
U.S. Cl. 9—2 **9 Claims**



An easily transportable boat having the strength, seaworthiness and general appearance of conventional craft consists of a plurality of individual, watertight hull portions which when assembled form the boat and when disassembled may be nested one within the other to conserve storage space. Included in the hull modules are seats, some of which fold up to make room for the other hull modules during storage and transportation.

3,611,459
COMPOSITE BOAT
Derek W. Sear, Wilslow, Ronald B. Noad, Urmston, and Peter Frank Panter, Didsbury, England, assignors to Dunlop Holdings Limited
Filed Sept. 15, 1969, Ser. No. 857,855
Claims priority, application Great Britain, Sept. 19, 1968, 43,863/68; Oct. 30, 1968, 51,365/68; Feb. 22, 1969, 9,648/69; June 7, 1969, 28,914/69
Int. Cl. B63b *7/08*
U.S. Cl. 9—2 **10 Claims**

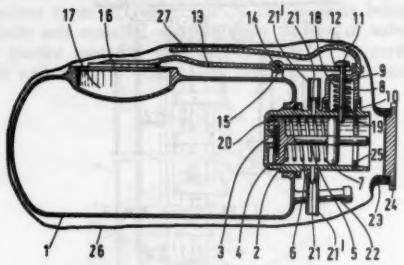


A composite boat comprising a rigid hull having an inflatable gunwale attached to the rim of the hull in such a manner that over a major portion of the length of the gunwale a portion of the gunwale projects outboard of the rim of the hull and at least the greater part of the gunwale volume lies above the rim of the hull. The inflatable gunwale is preferably constructed with flexible air chambers contained within an outer shape inducing protective covering of rubberised fabric.

3,611,460
LIFEBELT
Lino Rossetti, Via Cesare Battisti 27, Viareggio, Italy
Filed Sept. 11, 1969, Ser. No. 857,130
Claims priority, application Italy, Sept. 24, 1968, 53,248/68
Int. Cl. B63c *9/16*
U.S. Cl. 9—319 **4 Claims**

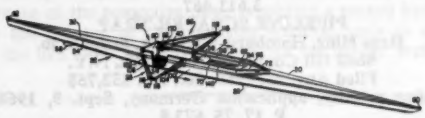
A safety lifebelt adapted to be inflated by hand and automatically by hydrostatic pressure acting upon a pan-

shaped portion of a rocking lever operating a valve to open a gas bottle provided in an air tube to allow the gas



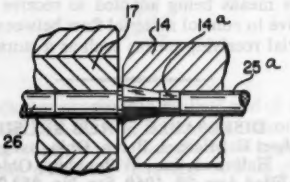
to escape from the bottle into the air tube to inflate the lifebelt.

3,611,461
SINGLE PERSON SHELL AND METHOD
William D. Wurzberger, 922 Tyson St., Baltimore, Md. 21201
Filed Mar. 18, 1969, Ser. No. 808,191
Int. Cl. B63b *3/02*
U.S. Cl. 9—6 **33 Claims**



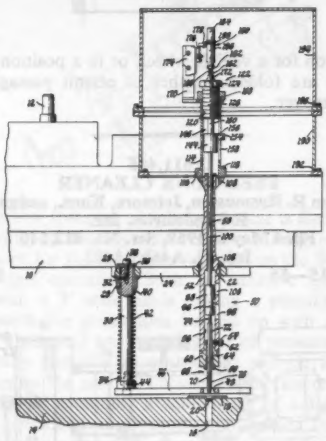
A slim, single person rowing shell made with sheet plastic hull, decks and rigid molded plastic cockpit, sealed together as a water-tight semi-hollow body. The hull and decks are vacuum formed and the cockpit is expansion cast. Buoyant plastic material enclosed in the body renders the shell substantially sink-proof. A uni-piece cockpit can include integral bracing which provides the requisite outrigger support structure for oars and auxiliary pontoons. Various structures are contemplated as alternate outrigger supports, some being made from integral plastic parts of the cockpit structure or metal tubing secured as truss structure to the cockpit rim.

3,611,462
METHOD OF MAKING HEX HEADED BOLTS AND SCREWS
Howard D. Prutton, 46833 Danbridge Road, Plymouth, Mich. 48170
Filed June 11, 1969, Ser. No. 832,178
Int. Cl. B21k *1/44*; B23g *9/00*
U.S. Cl. 10—27 **1 Claim**



A scrapless method is provided for cold forming a hexagon headed fastener such as a cap-screw or bolt, using two blows only, from a cylindrical metal blank having approximately the diameter of the fastener shank, wherein the first blow forms a regular prism of six faces at the head end of the blank having a dimension across diametrically opposed corners approximately equal to said blank diameter, and which at the same time forms a generally frusto-pyramidal portion flaring outwardly from the prism to a dimension slightly greater than the diameter of the blank; and wherein the second blow forms the finished head.

3,611,463
TAPPED HOLE CHECKING DEVICE
John R. Schirtzinger and Arthur H. Schorr, Columbus, Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed June 12, 1969, Ser. No. 832,791
Int. Cl. B23g *1/00*; G01b *3/40, 3/48, 5/16*
U.S. Cl. 10—129 **4 Claims**

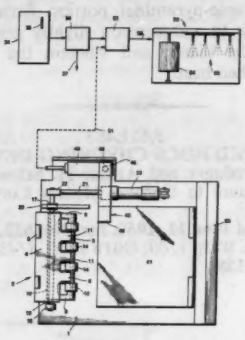


A tapped hole checking device has a rotatably driven spindle mounted on a vertically reciprocating tapping head of a tapping machine. A torque clutch on the lower end of the spindle mounts a probe with a threaded end, permitting the probe to be moved vertically. The probe is connected to a cam which responds to relative motion between the probe and the head to operate a switch mounted on the head. As the head lowers, the threaded end of the rotating probe engages and screws into a tapped hole at a rate faster than the head lowers to produce a relative motion between the head and the probe and close the switch. As the head raises, the rotation of the probe reverses to screw out of the tapped hole, again closing the switch, If during this cycle, the probe encounters a defectively tapped hole of any kind, it fails to close the switch both times and the machine shuts off.

3,611,464
AUTOMOBILE STOPPING DEVICE FOR USE IN A CAR WASH
Milan D. Boyanich, Amherst, N.Y., assignor to Miton Car Wash Equipment, Inc., Buffalo, N.Y.
Filed Sept. 19, 1969, Ser. No. 859,307
Int. Cl. B60s *3/04*
U.S. Cl. 15—21 R **6 Claims**

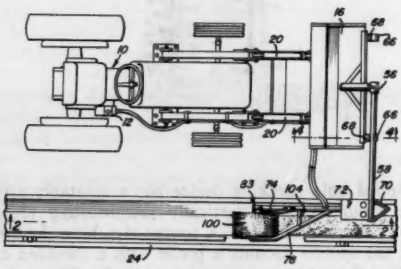
A power operated stop means to limit the movement of a vehicle to thereby stop it at a definite location relative to the movable washing apparatus of a vehicle washing installation is provided adjacent the wheel pad which actuates the switch means for initiating the wash cycle. The stop means comprises a pair of pivotally jointed

plates, one of which is secured to a base plate and the other of which is secured to a servomotor to be moved thereby for bringing the plates into extended position, to



act as a stop for a vehicle wheel, or to a position wherein the plates are folded together to permit passage of the wheel thereover.

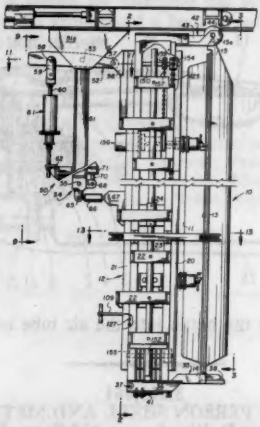
3,611,465
FEED BUNK CLEANER
William R. Rasmussen, Jetmore, Kans., assignor to R-J Industries, Inc.
Filed May 6, 1969, Ser. No. 822,140
Int. Cl. A46b *13/02*
U.S. Cl. 15—56 **8 Claims**



An attachment including a base to be mounted upon a vehicle for vertical adjustment relative thereto and for oscillation about a first horizontal transverse axis. A transverse support arm is supported at one end from the base for oscillation about a second axis disposed normal to the first axis. The other end of the support arm has the first front end of a trailing arm supported therefrom for limited universal movement relative thereto and the second rear end of the trailing arm has a powered rotary brush assembly supported therefrom whose rotary brush element is rotatable about a horizontal transverse axis.

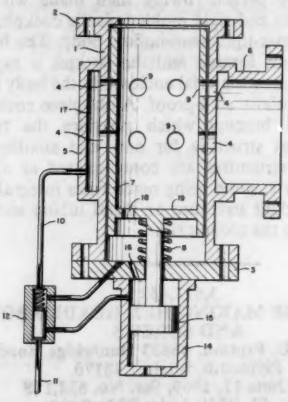
3,611,466
CLEANER HEAD FOR APPARATUS UTILIZED FOR CLEANING COKE OVEN DOORS
Charles D. McCullough, Metropolis, Ill., and Leo G. Schroeder, New Hyde Park, N.Y., assignors to Wilputte Corporation
Filed July 18, 1969, Ser. No. 843,009
Int. Cl. C10b *43/04*
U.S. Cl. 15—93 **6 Claims**

In apparatus for scraping undesired substances formed on a coke oven door during a coking operation, a door cleaner head having a frame is provided with endless tracks located in the front and rear portions thereof for permitting a scraper means to travel thereabout in a continuous endless path to scrape the undesired substances formed on the coke oven door. Means are further pro-



vided for orienting the cleaner head with the door to be cleaned along with means for removing debris from said front and rear tracks.

3,611,467
PIPELINE SCRAPER TRAP
Hans Hinz, Hamburg, Germany, assignor to Shell Oil Company, New York, N.Y.
Filed Aug. 25, 1969, Ser. No. 852,758
Claims priority, application Germany, Sept. 9, 1968, P 17 75 673.9
Int. Cl. B08b *9/04*
U.S. Cl. 15—104.06 A **5 Claims**

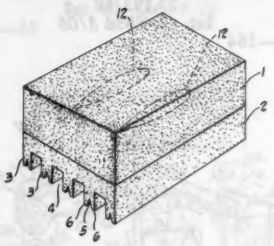


Scraper trap for use with a pipeline and including a housing having a movable sleeve means disposed therein, said sleeve means being adapted to receive said scraper and effective to control material flow between the pipeline and material receiving means such as a storage tank.

3,611,468
DISPOSABLE SCRUB BRUSH
Robert E. Michael, Berea, Ohio, assignor to Halbrand, Inc., Willoughby, Ohio
Filed Aug. 28, 1969, Ser. No. 853,729
Int. Cl. A47l *13/17*
U.S. Cl. 15—104.93 **5 Claims**

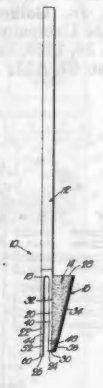
The disclosure herein is of a scrub unit which is intended for use in hospitals and under similar circumstances prmarily where the unit is of such a construction

and composition that the same may be disposed of if desired, after its scrubbing action has been accomplished. The unit basically comprises sections of different hardnesses and materials of generally cellular nature, such as various types of foam, one of the sections being of relatively soft material and the other section of substantially harder material with ridges provided to partially enfold and encircle body parts being scrubbed, and of



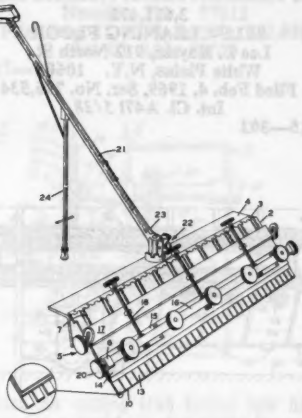
flexible enough nature to partially surround the same, yet sufficiently stiff to carry out the scrubbing of the pores which is desired particularly in use in medical applications. The scrub unit also contemplates the provision of a soap or similar solution in the soft material, the adherence of the respective parts providing a partial barrier for the passage of the cleansing solution such as soap or the like from the soft material to the harder section.

3,611,469
SASH PAINT APPLICATOR
Anselmo J. Belli, 17 Yates St., West Haven, Conn. 06516
Filed May 1, 1970, Ser. No. 33,798
Int. Cl. A46b *15/00*; B44d *3/16*
U.S. Cl. 15—118 **6 Claims**



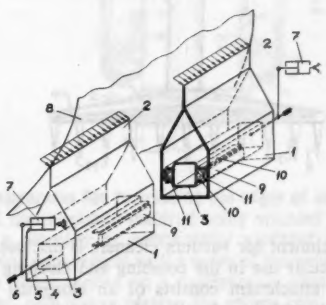
A paint applicator providing a resilient pad of truncated wedge shape carrying on one face a paint absorbing and applying cover sheet, and a handle with opposite end prongs, with the pad being mounted with its other face on the front of one of the prongs with its narrow end extending to the end of this prong, and the other prong being spaced rearwardly from the one prong and extending with its end beyond that of the one prong to serve as a guide in use of the applicator.

3,611,470
ADHESIVE SPREADER
Jack E. Gaston, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed June 8, 1970, Ser. No. 43,999
Int. Cl. B05c *11/04*
U.S. Cl. 15—235.6 **4 Claims**



An adhesive spreader of substantial size is disclosed for the spreading of flooring adhesive over a large area without the need for the mechanic to kneel on the floor as he performs this operation. Such an adhesive spreader is formed with a 3' wide blade having a plurality of adjustable teeth-like projections backed up with a flexible strike-off blade and an overlying set of pressure fingers, all resiliently mounted in position to provide automatic compliance to the normal unevenness of concrete floors, and capable of spreading a wide swath of adhesive in a uniform, controlled application. A mounting frame and adjustable handle structure permit the use of the spreader at the proper angle to the floor surface for best control of spreading and at the proper angle with respect to the direction of travel so as to divert the excess adhesive in the desired direction.

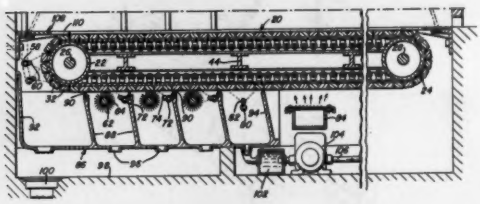
3,611,471
SCRAPER DEVICE
Olavi Meskanen, Vekarokatu, and Erkki Likola, Minna Canthinkatu, Finland, assignors to Valmet Oy, Helsinki, Finland
Filed June 19, 1968, Ser. No. 738,180
Int. Cl. D21g *3/02*
U.S. Cl. 15—256.51 **2 Claims**



A scraper device intended for use in paper machines and the like has turning cylinders at its ends for producing

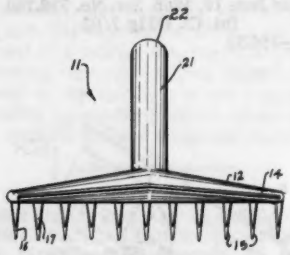
the required blade pressure against the roll. The body of the device includes a box-type beam to which a blade is fixed. Inside this beam there is another separate inner beam. Flexible loading tubes are located in spaces provided between the sides of the two beams. Variable pressures can be supplied to the tubes.

3,611,472
SELF-CLEANING FLOOR
Lee L. Kayser, 912 North St., White Plains, N.Y. 10605
Filed Feb. 4, 1969, Ser. No. 796,534
Int. Cl. A47l 5/38
U.S. Cl. 15—302 13 Claims



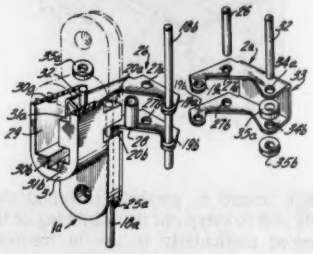
An endless revolving floor in the nature of a continuous belt or belt-like unit mounted between opposed rollers with the upper run thereof constituting the floor or support surface, whether it be for an animal barn or an area in the home, for example the hallway or kitchen. A series of sprays and brushes underlie the revolving floor for cleaning engagement with the lower run of the floor forming belt-like unit during the travel thereof whereby an automatic cleaning of the floor can be effected. A drying blower is also provided. As an alternative form, particularly adapted for use in the home, a low profile dry cleaning unit, incorporating a vacuum system aind revolving brush, can be provided.

3,611,473
VACUUM CLEANER ATTACHMENT FOR SHAG RUGS AND THE LIKE
Phillip P. Johnson, R.R. 2, Owatonna, Minn. 55060
Filed Aug. 1, 1969, Ser. No. 846,677
Int. Cl. A47l 9/02
U.S. Cl. 15—397 4 Claims



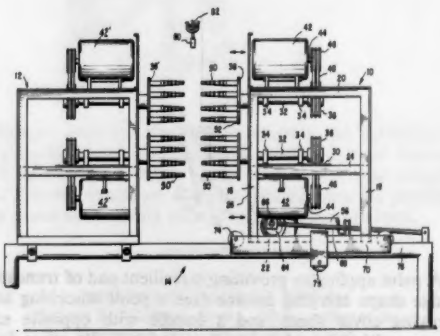
An attachment for vacuum cleaners is disclosed which finds particular use in the combing and cleaning of shag rugs. The attachment consists of an elongated housing from which extend a plurality of spaced finger members that provide a combing function as the attachment is drawn through the rug. Each of the finger members has a longitudinal bore that communicates with a source of vacuum and opens on the trailing edge of the finger member to pick up dust and dirt particles loosened by passage of the members through the rug.

3,611,474
INVISIBLE HINGE
Walter Meyer, Milan, Italy, assignor to The Stanley Works, New Britain, Conn.
Filed Oct. 21, 1969, Ser. No. 868,003
Claims priority, application Italy, Oct. 31, 1968, 23,193/68
Int. Cl. E05d 3/06
U.S. Cl. 16—164 2 Claims



An invisible hinge for doors and the like includes a pair of mounting blocks formed from a low-friction material such as nylon and joined by a pair of interlocked links. A pivot pin connects the links which are each pivotally connected at one end to the mounting blocks. The other ends of the links are mounted in slide bearings formed in the blocks to enable the links simultaneously to rotate with respect to their pivot pin and the block pivot pins, and to slide in the blocks, so that the axis of rotation of the blocks is not fixed in space. Hence the hinge is invisible upon closure of a door on which it is mounted.

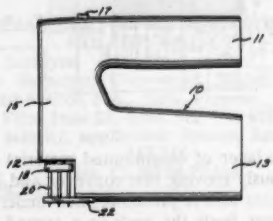
3,611,475
APPARATUS AND METHOD FOR REMOVING FEATHERS FROM POULTRY
Grover S. Harben, Jr., Gainesville, Ga., assignor to Gainesville Machine Company, Inc., Gainesville, Ga.
Filed Aug. 26, 1969, Ser. No. 853,100
Int. Cl. A22c 21/02
U.S. Cl. 17—11.1 13 Claims



Feather removal from chickens or other fowl is achieved by rotating opposing sets of flexible picking fingers against the body of a chicken or other fowl as it is conveyed along a predetermined path therebetween. The picking fingers are secured to frames positioned on opposite sides

of the path of travel and at least one frame is continuously reciprocated transversely of the path for continuously varying the degree of tightness by which the chicken or other fowl is gripped by the opposing sets of picking fingers.

3,611,476
MEAT TENDERIZER
Virginia L. Clifton, 1701 E. Louisiana Ave., Denver, Colo. 80210
Filed Jan. 2, 1969, Ser. No. 788,520
Int. Cl. A22c 9/00
U.S. Cl. 17—25 7 Claims

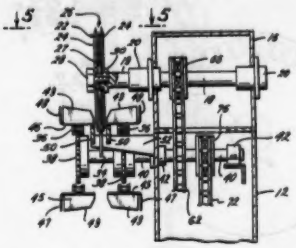


A portable meat tenderizing device comprising a reciprocating shaft with a multiple spiked element attached to the base thereof and a porous plate positioned below the spiked element through which the spikes pass in a reciprocating action. Thus, the reciprocating spikes exert a tenderizing action by repeatedly perforating the meat.

3,611,477
CHITTERLINGS SCRUBBER
Wallace F. Walter, 2743 Fontenelle Blvd., Omaha, Nebr. 68104, and Karl Oberdorfer, 24 Charles St., Council Bluffs, Iowa 51501
Filed Sept. 12, 1969, Ser. No. 857,362
Int. Cl. A22c 17/16
U.S. Cl. 17—43 14 Claims

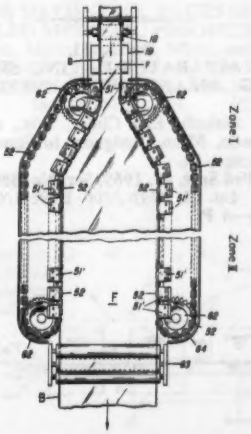
A cleaner for chitterlings comprises an elongated trough having a longitudinally corrugated inner surface and an elongated, rotary cleaning drum received within the trough having a longitudinally corrugated outer surface. The corrugations of the two surfaces produce a scrubbing effect on the chitterlings which are introduced into the trough, and a cleaning fluid spray directed along the drum advances the chitterlings through the trough. Contaminated fluid is continuously removed from the trough by a series of drain openings and overflow means, the latter also serving to maintain a constant level of cleaning fluid in the trough.

3,611,478
APPARATUS FOR CUTTING CRAB BODIES
W. Lee Lockerby, 13511A Northshore Drive, Houston, Tex. 77015
Filed Aug. 21, 1969, Ser. No. 852,059
Int. Cl. A22c 29/00
U.S. Cl. 17—71 5 Claims



A machine for cutting crab bodies into half sections while employing a double bladed cutter for removing the central longitudinal partition between the sections in order to expose the inner ends of the meat-containing compartments of both body sections for removal of the meat therefrom.

3,611,479
ORIENTATION APPARATUS
Guy J. Wicksall, Fayette, N.Y., assignor to Mobil Oil Corporation
Filed Sept. 2, 1969, Ser. No. 854,547
Int. Cl. B29d 7/24
U.S. Cl. 18—1 FB 2 Claims

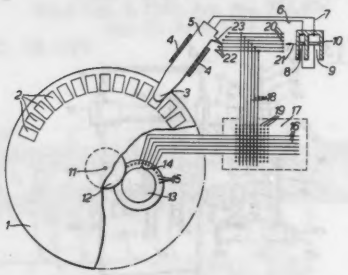


An apparatus for restraining the edges of an advancing web of thermoplastic material being oriented which comprises a plurality of permanently mounted idler rollers in nipping engagement with a series of individually mounted clip plates carried on a continuously advancing chain member, and means biasing the rollers into nipping engagement with the clip plates, for nipping at the interface of the rollers and the clip plates the edges of the advancing web.

3,611,480
MOULD FILLING PLANTS

Bernd Zippel, Langenhain, and Alfred Schlieckmann, Eschwege, Germany, assignors to Richard Zippel & Co. KG, Eschwege, Germany

Filed Feb. 20, 1970, Ser. No. 12,953
Claims priority, application Germany, Mar. 29, 1969, P 19 16 329.2
Int. Cl. B29c *3/06, 5/00;* B29h *3/08*
U.S. Cl. 18—4 P 6 Claims

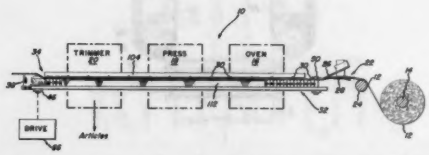


A control arrangement for a plastics material moulding plant is disclosed. The arrangement comprises an endless conveyor for carrying a plurality of moulds distributed on the conveyor and mould filling means for successively discharging mould filling material into the moulds. The conveyor is motivated so as to position the moulds successively at the mould filling means and the conveyor is coupled to a rotary selector of a selector switch. The fixed contacts of the selector switch are connected to a plurality of first conductors of a crossed-bar switch. The crossed-bar switch is provided with a plurality of further conductors which are selectably interconnectable to the first conductors. The further conductors are connected to control means for controlling the quantity of mould filling material discharged into the respective moulds in dependence on the interconnections between the first and further conductors.

3,611,481
MOLDING APPARATUS HAVING SHEET TRANSPORTING MEANS WITH PIERCER MEANS THEREON

Edward A. Malosh, Eau Claire, Wis., and Melroy L. Knee, Austin, Minn., assignors to Standard Oil Company, Chicago, Ill.

Filed Sept. 22, 1969, Ser. No. 859,824
Int. Cl. B29b *3/00;* B29c *3/04*
U.S. Cl. 18—4 P 3 Claims

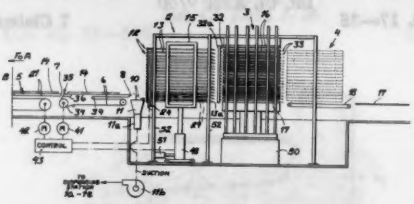


Disclosed is a novel sheet transporting apparatus including driven sprocket means having generally vertical axes of rotation, endless roller chain means carried by the sprocket means, restraining means adjacent to chain paths which engage the chain's rollers and restrain the chain means' lateral movement, and piercer means mounted on the chain means in a position to impale a sheet.

3,611,482
INSTALLATION FOR THE PRODUCTION OF PRESSED BOARD

Gerhard Hutz, Suchteln, Germany, assignor to Firma G. Siempelkamp & Co., Krefeld, Germany

Continuation-in-part of application Ser. No. 712,202, Mar. 13, 1968. This application Oct. 1, 1969, Ser. No. 862,881
Claims priority, application Germany, Nov. 22, 1968, P 18 10 240.4
Int. Cl. B29j *5/08*
U.S. Cl. 18—4 R 15 Claims

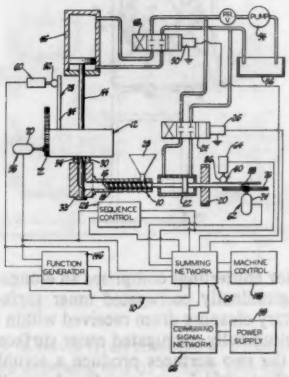


A continuous layer of comminuted material is strewn onto a continuously moving first conveyor and is divided into separate mats and is precompressed under a drum. The first conveyor feeds the mats to a second conveyor over a junction between the conveyors which can be reciprocated longitudinally. The downstream end of the second conveyor can also be longitudinally reciprocated to deposit the individual mats on one of a group of superposed tier conveyors which are individually operable to pick up the mats and jointly operable, e.g. by a rack-and-pinion arrangement to deposit the mats on the platens of a multilevel press. The second or accelerating conveyor is operable at two speeds: a relatively low speed corresponding to that of the first conveyor and a relatively high speed corresponding to that of the tier conveyors. In this manner, with sequenced speed change of the second conveyor and reciprocation of the junction, the mats are separated from one another. A chute below the downstream end of the second conveyor can receive defective mats or mats which continue to be fed while the charging rack empties into the press.

3,611,483
CONTAINER MAKING APPARATUS CONTROL SYSTEM

Donald L. Amsden and Casimir W. Nowicki, Toledo, Ohio, assignors to Owens-Illinois, Inc.

Filed Mar. 19, 1970, Ser. No. 21,054
Int. Cl. B29c *3/06*
U.S. Cl. 18—5 BC 11 Claims



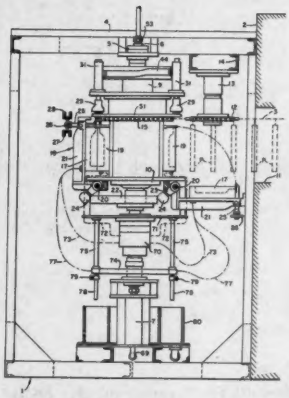
A system for controlling the movements of a neck mold and an extruder ram for container making apparatus.

Transducers sense velocity and position and develop feedback signals which are compared with command signals reflecting desired velocity and position. Error signals corresponding to the differences between the feedback and command signals are developed for adjusting the movements, if required. The system also correlates the velocity of the movements so as to maintain a predetermined velocity ratio between the movements of the neck mold and the extruder ram. As movements progress to different positions, a sequence control senses when the positions are reached and then adjusts the velocity of the movement with the next phase of the container making process.

3,611,484
APPARATUS FOR MANUFACTURE OF HOLLOW OBJECTS

Edouard Lecluyse, Dampierre-en-Crot, Aubigny, and Antoine Beranger, Charenton, France, assignors to Tuboplast-France, S.A., Paris, France

Filed June 25, 1969, Ser. No. 836,442
Claims priority, application France, June 28, 1968, 157,110
Int. Cl. B29d *27/04*
U.S. Cl. 18—5 BB **11 Claims**

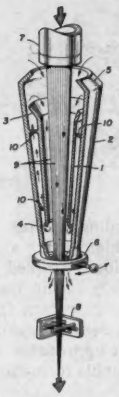


Machine for the continuous blowing of heated tubular preforms of thermoplastic material. A turret rotating continuously about a vertical axis, carries a plurality of molds and blowing heads, one for each mold. Each mold consists of a half fixed with the turret, and a second half pivotable from a first open position to a second position closed upon its fixed half. A chain has tubular link pivots each adapted to hold in depending relation therefrom, a respective heated preform. Rotation of the turret is synchronized with travel of the chain so that each preform moves with the chain into a respective open, fixed mold half. Cams fixed about the axis of rotation of the turret cooperate with cam follower means to (a) close each movable mold half onto its fixed half to enclose the preform, (b) lock the two mold halves together, (c) move the corresponding blowing head into pressure-tight relation with the tubular chain-link pivot, (d) operate a valve to connect the interior of the preform, through the tubular chain-link pivot, to a source of compressed air to expand the preform to the shape of the mold, (e) operate the valve to shut off compressed air and to connect the preform to exhaust, (f) cool the shaped article, (g) release the mold lock, (h) open the mold, and (i) remove the shaped article from its chain-link pivot. The operation is rapid, continuous, regular, uniform and without dwell.

3,611,485
SPINNING CHIMNEY

Allen E. Leybourne III, Decatur, Ala., and Carl J. Setzer, Durham, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 30, 1968, Ser. No. 787,882
Int. Cl. D01d; F28f *13/06*
U.S. Cl. 18—8 QD **9 Claims**

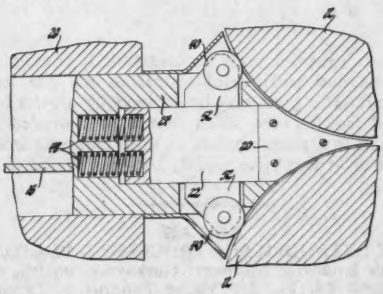


A spinning chimney to be used for the quenching of molten polymeric filaments, said chimney having walls which converge from top to bottom and through which the filaments and a quenching medium pass downwardly, and a wall engulfing shroud extending beyond the tops and bottoms of the walls and positioned to capture at least part of the fluid which exists from the bottom of the walls and redirect same back between the walls and shroud for flow adjacent the top of the walls onto the filaments.

3,611,486
APPARATUS TO CONTROL EDGES OF FLAT-ROLLED METALLIC PRODUCTS

Joseph J. Fox, Mount Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 5, 1969, Ser. No. 874,261
Int. Cl. B22f *3/18*
U.S. Cl. 18—9 **4 Claims**

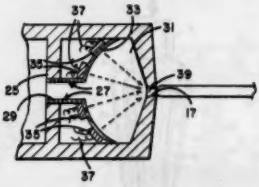


Apparatus as disclosed for supporting and controlling the edges of metallic material, especially particulate metal, as the material enters the bite of a rolling mill. The apparatus contains two wear block members adapted to fit into the bite region of the rolling mill and to guide and support the particulate metal being rolled. The wear members are supported so that they are substantially restrained from movement in all directions other than parallel to the direction of rolling.

3,611,487
APPARATUS FOR SONIC NUCLEATION FOAMABLE MATERIALS

Theodore H. Fairbanks, Liverpool, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Original application Feb. 28, 1968, Ser. No. 708,870. Divided and this application Jan. 22, 1970, Ser. No. 5,037
Int. Cl. B29f 3/04
U.S. Cl. 18—12 DV 2 Claims

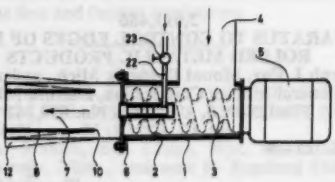


Apparatus for extruding molten foamable materials which includes an extruder having a discharge orifice and an arcuate sonic transducer coupled to the extruder and having a concave surface facing the extruder discharge orifice whereby the energy output from such transducer may be focused into a desired region within the molten foamable material as it approaches the discharge orifice for effecting incipient bubble formation.

3,611,488
MACHINE FOR CONTINUOUSLY CONSOLIDATING CHIPS AND DUST PARTICLES OF LEATHER OR THE LIKE

Kasimir Hoffmann, Forst, Germany, assignor to Badische Maschinenfabrik G.m.b.H., Karlsruhe-Durlach, Germany

Filed Sept. 5, 1968, Ser. No. 757,623
Claims priority, application Germany, Sept. 12, 1967, P 16 60 047.8
Int. Cl. B29f 3/04, 3/06
U.S. Cl. 18—12 SE 10 Claims



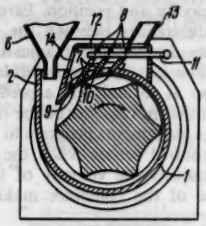
A worm extrusion press for continuously consolidating chips and dust particles of leather or the like into a solid body. This press may be additionally provided with a slotted reaction tube which permits the extruded body to expand to a certain extent so as to eliminate internal tensions or at first to be slightly compressed and then to expand.

3,611,489
DISK EXTRUDER FOR PROCESSING PLASTICS

Vladimir Ivanovich Morozov, Gorkovskoi oblasti, ulitsa Pirogova 34, kv. 13; Viktor Fedorovich Prygunov, Gorkovskoi oblasti, ulitsa Tereshkovoi 4, kv. 47; and Viktor Mikhailovich Khanov, Gorkovskoi, oblasti, ulitsa Pirogova 34, kv. 18, all of Dzerzhinsk, U.S.S.R.

Filed May 6, 1969, Ser. No. 822,276
Int. Cl. B29f 3/03
U.S. Cl. 18—12 R 4 Claims

An extruder for processing plastic in which a fixed disk having a feed throat is provided with a centrally disposed outlet for processed materials and a rotating disk located within the fixed disk coacts therewith to define an inner cavity. The fixed disk is formed with at least one through-hole communicating with the inner cavity and through

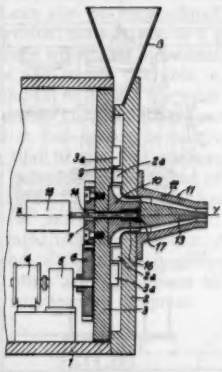


which gaseous substances evolved from the material undergoing processing are discharged.

3,611,490
EXTRUSION DIE FOR FORMING TUBES

Bernard Neuville, Versailles, and Raoul Hess, Chatillon-sous-Bagneux, France, assignors to Sidel, Société Anonyme, Le Havre, France

Filed June 23, 1969, Ser. No. 835,329
Claims priority, application France, June 28, 1968, 157,109
Int. Cl. B29f 3/04, 3/06; B29d 23/04
U.S. Cl. 18—12 C 2 Claims

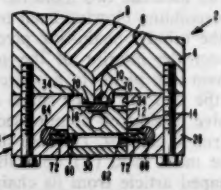


An extrusion die for forming tubular bodies from thermoplastic materials, which is mounted on a rotary plate extruder and comprises an external socket and an inner coaxial punch or core, characterized in that the die punch is held by a rod rigid therewith and extending through the rotary plate of the extruder, the axis of said rod being coincident with the plate axis.

3,611,491
APPARATUS FOR VARYING THE WIDTH OF EXTRUDED THERMOPLASTIC MATERIAL

James Louis Rector, Vienna, W. Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

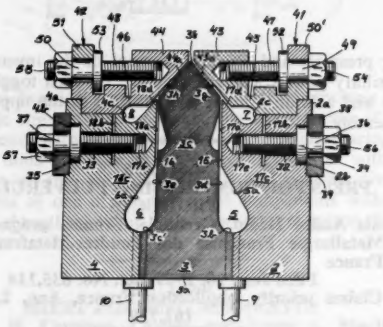
Filed July 1, 1969, Ser. No. 838,292
Int. Cl. B29f 3/04
U.S. Cl. 18—12 DS 10 Claims



Means for adjusting the width of sheeting of thermoplastic material extruded from an elongated extrusion

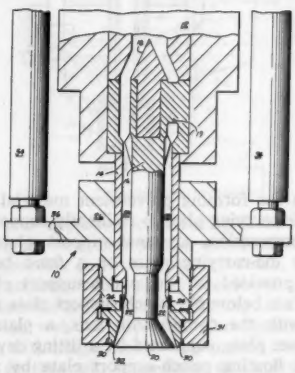
orifice of an extrusion die is provided, comprising a slide positioned over a portion of the orifice extending from at least one of its ends and a pair of cams oppositely rotating to urge the slide against the die to block that portion of the orifice from extruding sheet.

3,611,492
EXTRUSION NOZZLE FOR THE FORMATION OF MULTILAYER BANDS
Robert Scheibling, Cap d'Ail, France, assignor to Siamp-Cedap, Monaco
Continuation-in-part of application Ser. No. 798,404, Feb. 11, 1969. This application Oct. 30, 1969, Ser. No. 872,486
Claims priority, application Germany, Oct. 9, 1969, P 19 50 963.8
Int. Cl. B29f *3/04*
U.S. Cl. 18—13 P 2 Claims



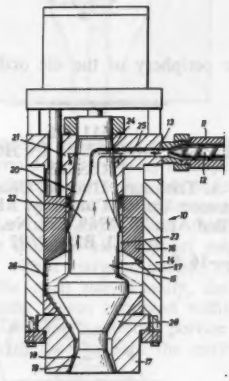
An extrusion nozzle for the formation of multilayer bands wherein a pair of resiliently deflectable lips flank each of a pair of passages merging together at the outlet of the nozzle and joining respective inner streams of extruded material passing through the inner passages. The lips are adjusted by screws operating against the inherent resiliency of the metal forming the lips.

3,611,493
VARIABLE ORIFICE EXTRUDER HEAD
Clement V. Fogelberg, Boulder, and William D. Hough, Arvada, Colo., assignors to Ball Corporation
Filed Dec. 24, 1968, Ser. No. 786,709
Int. Cl. B29d *23/04*
U.S. Cl. 18—142 3 Claims



A programable extruder head having a movable extrusion die assembly slidably mounted upon a fixed extrusion barrel and a fixed mandrel secured within the extrusion barrel, wherein the interface between the extrusion barrel and die assembly is in the form of a knife edge surface slidably bearing upon an insert planar surface.

3,611,494
EXTRUSION HEAD FOR EXTRUDING ANNULAR ARTICLES OF THERMOPLASTIC MATERIAL
Harald Feuerherm, Kohlkaul, Siegkreis, Germany, assignor to Kautex-Werk Reinold Hagen, Hangelar uber Sieburg, Rhineland, Germany
Filed Mar. 18, 1969, Ser. No. 808,159
Claims priority, application Germany, Mar. 18, 1968, P 17 04 791.5
Int. Cl. B29d *23/04*
U.S. Cl. 18—14 R 8 Claims

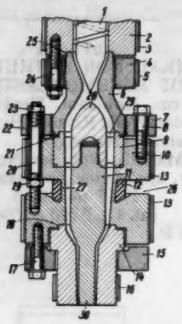


In an extrusion head an annular piston, during its extrusion stroke, penetrates into a storage chamber discharging therefrom thermoplastic material through an extrusion die. To refill the storage chamber in preparation for the successive extrusion stroke, thermoplastic material is introduced thereinto through a passage, the width of which is defined by a fixed part in the extrusion head and by a side wall of the annular piston. The material filling the chamber displaces the piston towards its retracted position in such a manner that the newly arriving particles settle immediately adjacent the leading face of the piston and remain substantially stationary within and with respect to the storage chamber. As a result, the material particles are discharged from the storage chamber in the order of their arrival thereinto.

3,611,495
CENTERING DEVICE FOR ANNULAR DIES FOR THE MANUFACTURE OF PLASTICS MATERIAL SHAPES
Erhard Langecker, Hohbuschener Weg 5, Meinerzhagen, Westphalia, Germany
Filed June 27, 1969, Ser. No. 837,272
Claims priority, application Germany, Oct. 18, 1968, P 18 04 640.7
Int. Cl. B29d *23/04*
U.S. Cl. 18—14 V 6 Claims

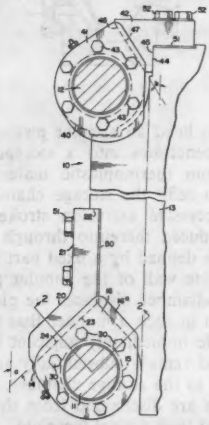
A centering device for annular dies for the manufacture of plastic-material bodies, wherein a die jacket is transversely adjustable in relation to a die core by clamping means extending parallel to the die axis. The clamping means engages two portions separated by an annular weakening of the exterior of the die jacket lying transversely to the die axis, and wherein the axial spacing of the die mouth from the annular weakening in relation to

the rigidity of the die jacket is such that upon adjustment of the clamping means there is no significant distribution



of the outer periphery of the die orifice defined by the die jacket.

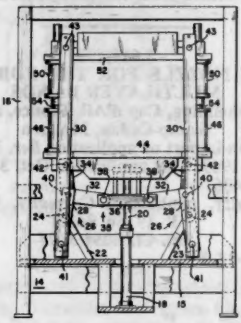
3,611,496
GUIDES FOR BOLSTERS IN HORIZONTAL PRESSES
Harry A. Trishman, Hudson, Ohio, assignor to Adamson United Company, Akron, Ohio
Filed Apr. 23, 1969, Ser. No. 818,758
Int. Cl. B29c *3/02*
U.S. Cl. 18—16 R **11 Claims**



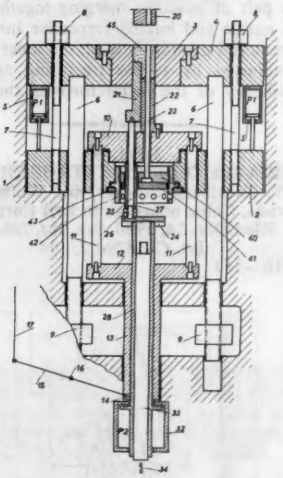
. In the guides for bolsters, a support block is in slidable engagement with a strain rod and a pair of keeper plates are secured to adjacent opposite faces of the support block and encompass the strain rod. A support member is received between peripheral portions of the opposed keeper plates and has an extension protruding therefrom secured to and supporting the bolster, while the bolster itself is positioned in floating relationship between the keeper plates, a plurality of support block assemblies being provided.

3,611,497
TIE-RODLESS DOUBLE ACTING PRESS
Lester Gidge and Valmor R. Poulin, Jr., Nashua, N.H., assignors to Nashua Industrial Machine Corporation, Nashua, N.H.
Filed May 1, 1969, Ser. No. 820,894
Int. Cl. B30b *1/16*
U.S. Cl. 18—16 T **8 Claims**

A novel toggle press wherein the gross vertical movements of two movable platens is achieved with a single actuating ram by use of toggle assemblies and with each platen acting as a counterweight to aid in raising the other platen. This press utilizes auxiliary power means, independent of the single actuating ram, to apply molding pressure, and one embodiment of the invention this auxiliary power means is mounted on each toggle assembly and acts on a pivot pin attached to the upper platen assembly.



3,611,498
PRESS FOR COMPRESSING PULVERULENT PRODUCTS
Louis André Hédin, Grenoble, France, assignor to La Metallurgie Francaise des Poudres-Metafram, Paris, France
Filed June 20, 1969, Ser. No. 835,114
Claims priority, application France, Aug. 2, 1968, 161,739
Int. Cl. B30b *11/00*
U.S. Cl. 18—16.7 **4 Claims**

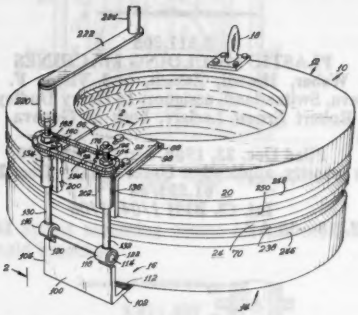


A press for forming pulverulent material to which a floating die-carrying plate is resiliently supported to yield during compression, a punch-support plate is located below the die-carrying plate on a fixed bed, a lifting device is provided for the punch-support plate, a core-support plate below the punch-support plate and movable parallel with the compression axis, a plate below the core-support plate, supported by a lifting device and coupled to a floating punch-support plate by rods passing through the core-support plate and punch-support plate, a stop limiting the minimum distance of the punch-support plate and the core-support plate.

3,611,499
TIRE FORMING APPARATUS

Stewart W. Getty, Ocala, Fla., assignor to National-Standard Company, Niles, Mich.

Filed Sept. 24, 1968, Ser. No. 761,908
Int. Cl. B29h 5/02
U.S. Cl. 18—18 F 9 Claims

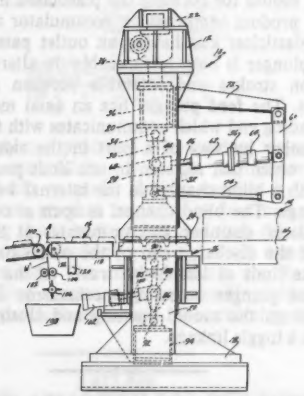


In tire forming apparatus of the type comprising two separable tire mold components, the construction of the hinge means permits adjustment of the relative spacing of the tire mold components for use either with or without a spacer of any practicable width and permits pivotal movement of one of the tire mold components with respect to the other, either with or without a spacer therebetween.

3,611,500
SHEET FORMING APPARATUS

William H. Carrigan, Croton, and James A. Maclam, Comstock Park, Mich., assignors to Gloucester Engineering Co., Inc., Gloucester, Mass.

Original application Oct. 1, 1968, Ser. No. 764,128, now Patent No. 3,518,334, dated June 30, 1970. Divided and this application Jan. 16, 1970, Ser. No. 8,137
Int. Cl. B29c 17/02, 17/14, 3/04
U.S. Cl. 18—19 R 9 Claims

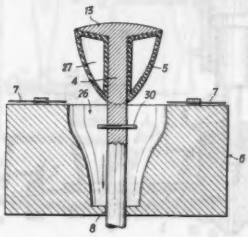


Method and apparatus of forming three dimensional articles such as trays into plastic web stock by heat and pressure, especially in foam type web stock, peripherally cutting the articles while still in the forming equipment for separation from the web but leaving tabs holding the articles to the web matrix, while also forming a special relief pleat, with hinges, in the web and/or causing special relief slits in the web, to prevent subsequent shrinkage and tension stresses in the web matrix from causing the articles to prematurely break loose from the matrix or to be shifted out of proper orientation or registration.

3,611,501
APPARATUS FOR MANUFACTURING FOOTWEAR

Helmut Daum, Eberbach, Germany, and Oskar Schmidt, Wyrgasse 6, Vienna, Austria; said Daum assignor to said Schmidt

Original application May 1, 1967, Ser. No. 636,242, now Patent No. 3,535,418, dated Dec. 17, 1969. Divided and this application June 18, 1970, Ser. No. 47,511
Claims priority, application Austria, May 3, 1966, A 4,181/66
Int. Cl. B29h 5/12, 9/00
U.S. Cl. 18—19 S 8 Claims

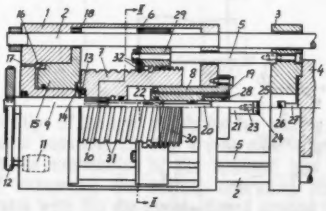


Device for making footwear wherein the mold is equipped with a mold cavity having a shape corresponding to the shape desired for a finished shoe upper. This cavity has an open side and is adapted to accommodate a main body portion of an upper blank of deformable material. The device includes also support means for supporting the blank with a marginal portion extending outwardly through the open side. Finally, the device also includes the forming means arranged within the cavity and adapted to deform the main body portion of the blank into conformity with the shape of the cavity.

3,611,502
HIGH PRESSURE RAPID ACTING CLOSURE APPARATUS FOR INJECTION MOLDING AND THE LIKE

Peter Florjancic, St. Martinstr. 12, Garmisch-Partenkirchen, Germany

Filed Apr. 27, 1970, Ser. No. 32,166
Claims priority, application Austria, Apr. 28, 1969, A 4,081/69
Int. Cl. B29f 1/00; B30b 1/18
U.S. Cl. 18—30 LV 10 Claims

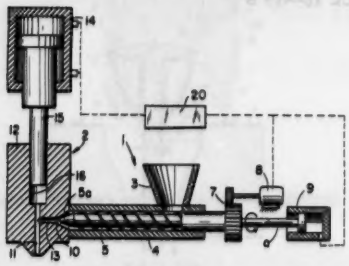


A high pressure rapid acting closure apparatus for injection molding applications and the like is described. A closure member for high pressure working in a working region such as an injection mold is reciprocatingly mounted to a frame. The closure member is reciprocated with a lead screw and associated nut. The screw thread effective between the lead screw and nut is apportioned into a high speed, low frictional section for predetermined portion of the reciprocating stroke and a high axial strength bearing enhanced frictional section operative for the remainder of the stroke. High pressure operation is effected when the second high axial strength portion of the screw thread is effective between the nut and lead screw. The closure apparatus may be operated at high speeds with little heating.

3,611,503
INJECTION MOLDING APPARATUS FOR PLASTIC MATERIALS

Armin Blumer, Schwanden, Switzerland, assignor to Maschinenfabrik und Giesserei Netstal AG, Netstal, Switzerland

Filed Apr. 15, 1969, Ser. No. 816,212
Claims priority, application Switzerland, Apr. 18, 1968, 5,941/68
Int. Cl. B29f 1/04
U.S. Cl. 18—30 AM 4 Claims

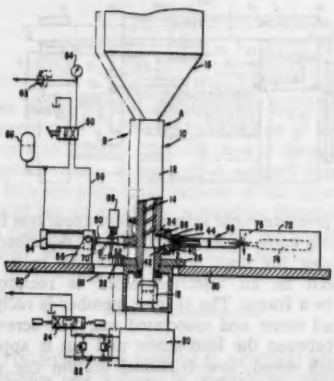


Injection molding apparatus for plastic materials includes a plastifying screw rotatable in a plastifying cylinger communicating with an injection cylinder having an injection piston reciprocable therein, and a channel interconnecting the two cylinders. The channel has a valve seat facing the plastifying cylinder, and the screw has a forward end constructed as a valve member engageable with the valve seat. Piston means are operable, immediately prior to the injection period, to displace the screw axially to engage the valve member sealingly with the valve seat to interrupt communication between the two cylinders during the injection period.

3,611,504
NOZZLE SYSTEM AND INJECTION NOZZLE FOR INJECTION BLOW MOLDING AND INJECTION MOLDING MACHINES

Joseph A. Johnson, Brigantine, N.J., assignor to Jomar Industries, Inc., Brigantine, N.J.

Filed Oct. 23, 1969, Ser. No. 868,766
Int. Cl. B29f 1/03
U.S. Cl. 18—30 CR 9 Claims

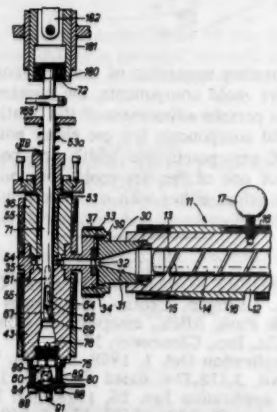


An extruder screw mechanism for injecting plastic melt into a mold cavity is mounted for bodily movement relative to the mold and has a telescopic injection nozzle unit that is extended by the plastic material pressure in the mold cavity with which the tip of the nozzle unit is in sealing engagement so as to cause the screw mechanism to move back away from the mold against the holding pressure of a hydraulic cylinder. The movement of the mechanism actuates a limit switch that controls a solenoid valve to stop the screw and reverse its rotation for a timed interval, decompressing the plastic melt in the nozzle unit to prevent plastic melt drool when the cavity opens, and allowing the nozzle unit to return to its original shortened position.

3,611,505
PLASTIC MOULDING MACHINES

Eugen Weber, Hinwil, Zurich, and Victor F. Zahner, Geneva, Switzerland, assignors to Harry Dudley Wright and Robert Ernest Leclerc, both of Geneva, Switzerland

Filed Dec. 23, 1969, Ser. No. 887,590
Claims priority, application Great Britain, Dec. 27, 1968, 61,523/68
Int. Cl. B29f 1/04, 1/06
U.S. Cl. 18—30 AP 14 Claims



A metering device for a plastic moulding machine having a plasticiser for supplying plasticised material and a product mould for forming the plasticised material into a finished product comprises an accumulator chamber open to the plasticiser and having an outlet passage in which a feed plunger is both reciprocable on alternate feed and retraction strokes and rotatable between angular limit positions. The feed plunger has an axial metering cavity in its leading end which communicates with the accumulator chamber by way of a port in the side of the feed plunger which can register, in one limit position of rotation, with a blind channel in the internal wall of the outlet passage. The blind channel is open at one end to the accumulator chamber and terminates at the other end short of the discharge end of the outlet passage but beyond the limit of lengthwise travel of the plunger port. The feed plunger actuating mechanisms are preferably driven from the mould opening and closing mechanism through a toggle linkage.

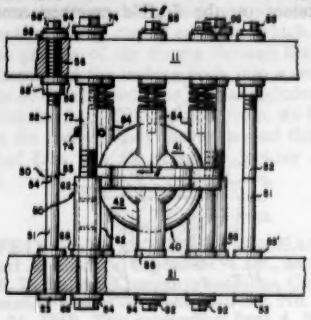
3,611,506
CENTRIFUGAL CASTING SPIDER AND MOLD MOUNTING THEREON

Harry C. Schroeder, 1625 Graham Road, Stow, Ohio 44224

Filed Apr. 30, 1969, Ser. No. 820,373
Int. Cl. B29c 5/04
U.S. Cl. 18—43 7 Claims

High temperature steel centrifugal casting spiders have a different rate of expansion than the aluminum molds mounted thereon. The invention deals with means whereby the spiders when closed define a rigid structure between which aluminum mold halves are supported for freedom

of expansion yet so closed that flashing on the molded product at the parting line between mold halves is virtually



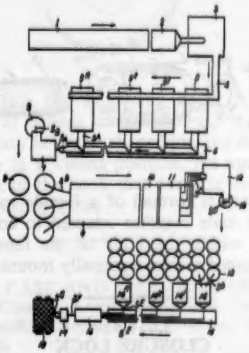
eliminated. Spring mounting means for the mold halves reduces mold breakage.

3,611,507

PRODUCTION OF WORSTED TOPS

Tadao Ootsuki, Tadakatsu Fukui, Yoshiaki Nakahara, and Seisaku Asada, Hikone, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1969, Ser. No. 850,940
Claims priority, application Japan, Aug. 22, 1968, 43/60,075
Int. Cl. D01b *3/04*
U.S. Cl. 19—66 1 Claim



Worsted tops are produced by washing, drying and storing a wool material in a wool bin, then conveying it from the wool bin to cards, thereby carding it to form slivers. The slivers are then conveyed to first draft means, thereby drafting them, backwashed and then dried, gilled by a back after-gill, drafted by second draft means, and combed by combers. The combed slivers are then conveyed to shuffling means, thereby shuffling them and finally gilled by a high speed gill, thus forming worsted tops.

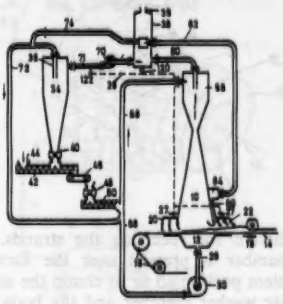
3,611,508

METHOD AND APPARATUS FOR DRY FORMING WEBS OF PULP FROM VEGETABLE FIBROUS MATERIAL

Rolf Bertil Reinhall, Lidingo, and Karl Nicolaus Cederquist, Stockholm, Sweden, assignors to Defibrator Aktiebolag, Stockholm, Sweden

Filed Feb. 27, 1969, Ser. No. 803,024
Claims priority, application Sweden, Mar. 7, 1968, 3,054/68
Int. Cl. D01g *15/00*
U.S. Cl. 19—156.3 9 Claims

This invention relates to a method and an apparatus for continuous dry-forming a web or bat of pulp from vegetable fibrous material on an endless wire screen by introducing into a forming chamber opening towards said wire screen a dispersion of fibers in a gas and simultaneously creating on the rear side of said wire screen opposite to said forming chamber so much reduced pressure that more gas is sucked through the wire screen than is applied with the vehicular gas in the dispersion of fibers



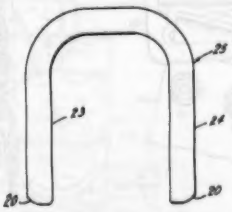
in gas, the additional gas being introduced between said wire screen and the lowermost portion of the forming chamber, and by recirculating the withdrawn gas through a conduit system to the feed side of the forming chamber together with new fibrous material. The additional gas is withdrawn from the conduit system to avoid introduction of atmospheric air.

3,611,509

METHOD AND APPARATUS FOR FORMING CLIPS

Karl A. Klenz, Oakland, Calif., assignor to Rheem Manufacturing Company, New York, N.Y.

Continuation-in-part of application Ser. No. 808,511, Mar. 19, 1969. This application Nov. 20, 1969, Ser. No. 878,437
Int. Cl. B21f *45/16*; F16b *15/00*
U.S. Cl. 24—30.5 W 10 Claims



U-shaped clips of the type employed for sealing sausage casings, plastic bags and the like are formed with arcuate surfaces on the extremities of the opposed legs for the purpose of enhancing the sealing operation when the clip cooperates with the die and is closed around the article to be sealed. A notching and swaging punch is applied to the wire from which the clips are formed to provide arcuate surfaces on the wire prior to cutting the wire into the lengths from which the clips are formed.

3,611,510

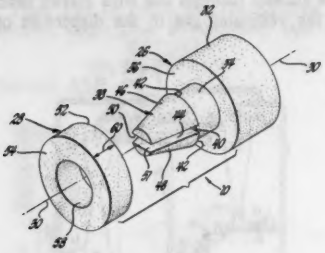
TWO-PIECE CORD FASTENER

John L. Bennett, Dayton, and James A. Partlow, Vandalia, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 7, 1969, Ser. No. 864,434
Int. Cl. F16g *11/00*
U.S. Cl. 24—126 1 Claim

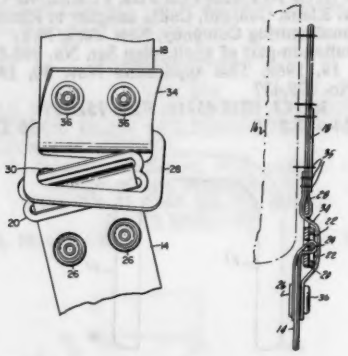
In a preferred form, a two-piece fastener for securing the end strands of a cord used to bind windings in a

dynamoelectric machine includes a fastener body member having an integral and axially extending stem portion and a separate annular washer member. The stem portion includes a forward end which has a transverse slot



formed therein for receiving the strands. The annular washer member is pressed over the forward end and onto the stem portion so as to clamp the strands between the annular washer member and the body member.

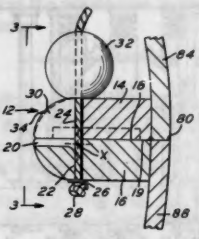
3,611,511
QUICK-RELEASE FASTENING DEVICE
Richard W. Grabenkort, Grand Prairie, and James N. Karas, Arlington, Tex., assignors to the United States of America as represented by the Secretary of the Navy
Filed Feb. 25, 1970, Ser. No. 14,154
Int. Cl. A44b *17/00*
U.S. Cl. 24—201 **2 Claims**



A pair of straps are detachably connected by a buckle, the latter being made up of two slotted plates respectively carried on the strap ends. One plate is of greater width than the slot in the other plate, so that the former can only be inserted in or removed from the latter when the two plates are positioned in angular relationship to one another. A safety flap maintains the desired parallel interlocking condition during periods of strap connection.

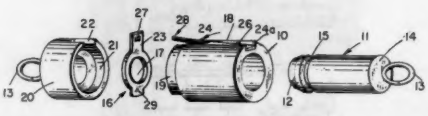
3,611,512
LATCH AND DEVICE CONTAINING SAME
Donald H. Sholl, Munn Lane, Cherry Hill, N.J. 08034
Filed June 8, 1970, Ser. No. 44,495
Int. Cl. A44b *17/00*
U.S. Cl. 24—201 **9 Claims**

The latch is comprised of first and second latch members juxtaposed to one another. The first latch member has a hole and a notch for receiving a flexible member connected thereto. The second latch member has a slot aligned with the notch and through which the flexible member may extend so as to be in an operative disposition. A retainer on the flexible member contacts the



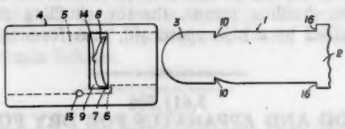
second latch member in the operative disposition of the flexible member. The latch member may be utilized in a variety of devices including toys.

3,611,513
JEWELRY CLASP
Daniel Hoober, R.F.D. 1, Box 254, Sound Beach, N.Y. 11789, and Charles Frankel, 2702 Ford, Brooklyn, N.Y. 11235
Filed Nov. 12, 1969, Ser. No. 875,861
Int. Cl. A44b *17/00*
U.S. Cl. 24—211 **10 Claims**



A jewelry clasp is formed of a female member and a complementary male member adapted to cooperate with a lock located within the body of the female member. The lock is engaged via an externally mounted spring.

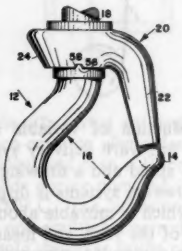
3,611,514
CLOSURE LOCK
Eric de Wit, 211 Larochegasse, 1130 Vienna, Austria
Filed Oct. 8, 1969, Ser. No. 864,828
Claims priority, application Austria, Oct. 9, 1968, 9,870/68
Int. Cl. A44b *19/00*
U.S. Cl. 24—230 SL **12 Claims**



A safety device or locking device for the closure of a package, barrel, carton and the like, including a female member or channel having an opening for receiving a male member or tongue. The male and female members are advantageously made of an inexpensive plastic material and the channel which is formed in the female member includes a locking body which is formed by cutting away an overlying portion of the channel. The locking body includes a curved member which is connected to the

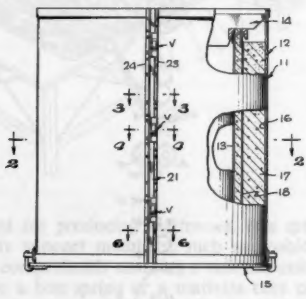
channel by a thin web and which is positioned in the channel passageway so as to intercept the tongue which is inserted into the channel. The locking body and the tongue have complementarily curved end faces which interengage during the passage of the tongue through the channel to cause deflection of the locking body into a recess defined at the side of the channel. The tongue includes a recessed side portion at a spaced location from its forward tip and when the locking body moves beyond this recess the end thereof falls into the recess in locking engagement therewith.

3,611,515
SAFETY GATE LATCHING MECHANISM
Herbert A. Raschke, Greenbrae, Calif., assignor to E. D. Bullard Company, Sausalito, Calif.
Continuation-in-part of application Ser. No. 793,825, Jan. 24, 1969. This application June 4, 1970, Ser. No. 43,324
Int. Cl. B66c *1/34*
U.S. Cl. 24—241 PL **6 Claims**



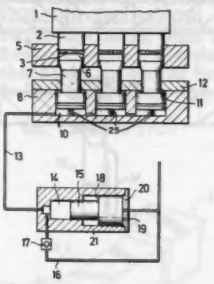
A safety gate for a hoisting hook. A spring loaded mechanism for biasing the gate toward a closed position. Complementary keystone shaped locking members that retain the gate in a closed position. An annular abutment on the shank of the hook that protects the spring against excessive shearing forces.

3,611,516
MOLD CASE AND VIBRATOR ASSEMBLY
James F. O'Conner, Long Beach, and Gordon J. Black, Norco, Calif., assignors to Ameron, Inc., Monterey Park, Calif.
Filed May 27, 1968, Ser. No. 732,335
Int. Cl. B28b *21/02*
U.S. Cl. 25—30 R **6 Claims**



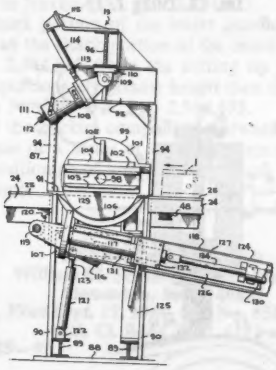
The outer steel shell or case of a mold for casting concrete pipe having a gate and vibrators mounted on the gate with their axes of rotation normal to the axis of the case and outside the case.

3,611,517
MULTIARTICLE PRESS WITH HYDRAULICALLY BIASSED LOWER RAMS
Jacob Giersberg, Merzig, and Albert Reiplinger, Bachem, Germany, assignors to Villeroy & Boch Keramische Werke KG, Mettlach, Germany
Filed Apr. 25, 1969, Ser. No. 819,316
Claims priority, application Germany, Apr. 30, 1968, P 17 59 429.5
Int. Cl. B28b *3/08*
U.S. Cl. 25—91 **7 Claims**



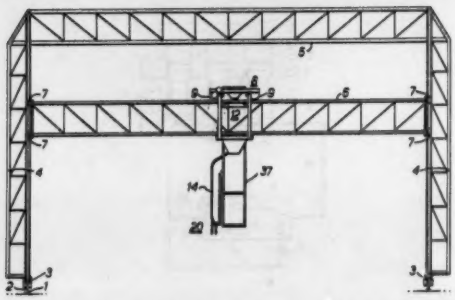
A multiarticle press for ceramic goods has lower, hydraulically biassed rams which are connected with a source of hydraulic biassing pressure via a shuttle piston in order to lead downwards movement of the rams.

3,611,518
APPARATUS FOR REMOVING CURED CONCRETE ARTICLES FROM PALLETS
Ercell L. Glass, Tampa, Fla., assignor to American Concrete Crosstie Corporation, Tampa, Fla.
Original application Aug. 11, 1967, Ser. No. 660,133. Divided and this application Oct. 30, 1969, Ser. No. 872,662
Int. Cl. B28b *13/06*
U.S. Cl. 25—120 **6 Claims**



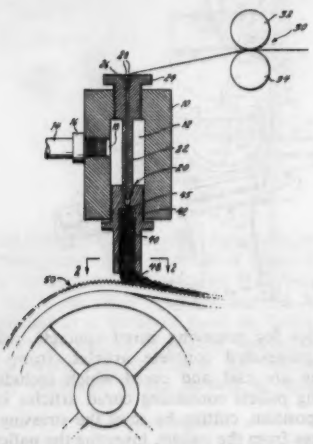
Apparatus for removing cured concrete articles, particularly prestressed concrete articles, from pallets in which they are cast and cured which includes feeding and guiding pallets containing cured articles into predetermined position, cutting by saws the stressing cables to free castings from the pallets, inverting the pallets beneath plungers which enter openings in the pallet bases and press castings from the pallets onto receiving means which lower them to an accumulating area, reverting the pallets to their previous orientation, driving the cut cable ends from the pallet retaining means by swinging hammers, and cleaning, oiling and restranding the empty pallets, the pallets being moved step by step from one operating procedure station to the next from entering into the apparatus to exit therefrom.

3,611,519
MACHINE FOR DIRECT AND CONTINUOUS CASTING OF CONCRETE WALLS
Nils Folke Larsson, 27 Saterivagen, 161 70 Bromma, Sweden
Filed June 6, 1969, Ser. No. 830,976
Claims priority, application Sweden, June 17, 1968, 8,150/68
Int. Cl. E04g 11/34
U.S. Cl. 25—131 SC 8 Claims



A method and a machine for casting concrete walls by introducing concrete into a mold comprising two parallel discs having comparatively small dimensions and being continuously reciprocated along the wall being cast by means of a traveling crane so as to deposit a thin strip of concrete each time it passes along the wall, with said deposited strip of concrete simultaneously being rammed to compactedness.

3,611,520
APPARATUS FOR TEXTURING YARN
Alvin E. Faidley, Jr., Roanoke County, Va., assignor to Fred Whitaker Company, Bala-Cynwyd, Pa.
Filed July 30, 1969, Ser. No. 846,161
Int. Cl. D02g 1/12
U.S. Cl. 28—1.6 1 Claim



A source of steam under pressure feeds a steam box from which the steam is emitted through a needle valve into a chamber. Yarn is pulled through the needle valve by the steam and crimped under pressure in the chamber. A knurled surface moves at a spaced distance from the end of the chamber and carries the crimped material away. Most of the steam exits from the chamber before the yarn exits from the chamber.

3,611,521
DEVICE FOR PRODUCTION OF NOVELTY YARN
Claude Corbiere, La Tour-de-Salvagny, France, assignor to Societe Rodiceta
Filed June 24, 1968, Ser. No. 739,519
Claims priority, application France, June 22, 1967, 111,538
Int. Cl. D02j 1/22
U.S. Cl. 28—71.3 3 Claims

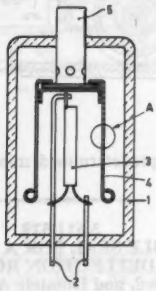
Device for production of variable denier yarn that comprises at least one yarn delivery system which feeds yarn at a constant speed and a drawing system. Between the delivery and drawing systems is disposed at least one rigid yarn guide, which is movable about an axis at right angles to the path of the yarn, and means for driving the said yarn guide in a circular movement about the said axis.

There is also disclosed the product made by a process using this device.

3,611,522
METHOD OF CRIMPING CONTINUOUS FILAMENT
Barrie Daniels and William Edward Whale, Pontypool, England, assignors to Imperial Chemical Industries Limited, London, England
Continuation of application Ser. No. 622,640, Mar. 13, 1967. This application Nov. 1, 1968, Ser. No. 786,525
Claims priority, application Great Britain, Mar. 22, 1966, 12,374/66
Int. Cl. D02g 1/20, 1/14
U.S. Cl. 28—72.11 8 Claims

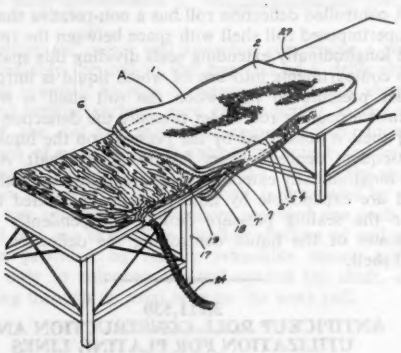
Tandem hot gear-crimping, with the gears of the second assembly having differing crimping characteristics, e.g. teeth-per-inch, from those of the first assembly.

3,611,523
ELECTRIC DISCHARGE TUBE HAVING AT LEAST ONE NON-EMITTING ELECTRODE WHICH CONSISTS AT LEAST SUPERFICIALLY OF NICKEL
Ernst Sigmund Den Dulk, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed May 21, 1969, Ser. No. 826,599
Claims priority, application Netherlands, May 31, 1968, 6807777
Int. Cl. H01j 9/00
U.S. Cl. 29—25.14 4 Claims



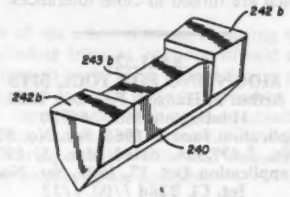
A method of manufacturing an electric discharge tube by first coating non-emitting electrodes such as an anode with a layer of nickel and then a layer of gold, and then heating the electrode during pumping to a degassing temperature about 780° C. The emission-suppressing characteristics of the non-emitting electrodes are maintained even though the gold dissolves in the nickel.

3,611,524
METHOD FOR COVERING MATTRESSES AND THE LIKE
Horace N. Broyles, 309 Pineapple St., Sebastian, Fla. 32958
Filed Sept. 8, 1969, Ser. No. 870,303
Int. Cl. B68g 7/00
U.S. Cl. 29—91.1 10 Claims



A method for producing mattresses, box springs, and related body support members, such as cushions, pads, etc., which comprehends encasing a resilient unit, whether the same be a box spring or a mattress core comprising an inner spring or a unitary block of cellular material, within an impervious film, and then through vacuum means withdrawing the air from said core for reducing the same volumetrically to a minor percentage of its normal volume; then inserting the air evacuated, film-covered unit within a cover; closing the cover while simultaneously permitting air flow to said unit to allow the same to return to normal volume within the cover; the cover having been appropriately closed during such expansion. The present method contemplates a procedure whereby the film may be retained upon the unit when inserted within the cover as well as withdrawn prior to completing the article formation.

3,611,525
CUTOFF OR GROOVING TOOL AND HOLDER THEREFOR
Burton L. Cochran, North Canton, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio
Continuation of abandoned application Ser. No. 716,843, Mar. 28, 1970. This application Apr. 1, 1970, Ser. No. 24,808
Int. Cl. B26d 1/00
U.S. Cl. 29—95 7 Claims

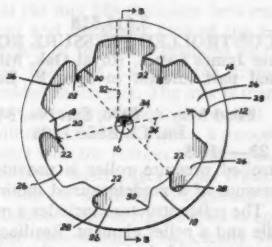


A cutoff or grooving tool that includes a holder and a replaceable cutting insert with the holder including a main body portion, a support blade, and a clamping arm and with the insert being an elongate, relatively pencil-like component adapted to be seated on the blade of the holder and clamped in place thereon by the clamping arm with a backup element serving to determine the extent of longitudinal projection of the cutting insert on the support blade. The insert and holder are characterized by complementarily engaged V-shaped surfaces of the type set forth in Novkov U.S. Pat. 2,964,833.

The shank portion of the insert generally has a lesser height than the shank portion of the insert shown in Novkov Pat. 2,964,833 while the cutting tip portion thereof has a proportionately greater height than that of the insert shown in Novkov U.S. Pat. 2,964,833.

Use of the backup component rearwardly of the insert permits use of a series of such members so as to insure correct positioning of inserts having shank portions of different length.

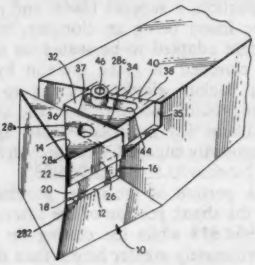
3,611,526
EXTERNAL REAMER
William M. Scribner, 112 E. 7th St., Alexandria, Ind. 46001
Filed Sept. 17, 1969, Ser. No. 858,820
Int. Cl. B26d 1/00, 1/12
U.S. Cl. 29—95 6 Claims



This invention is an external reamer which includes an elongated body having an elongated cavity opening

through one end thereof. A plurality of cutting bits integral with said body are located within said cavity. The bits project radially inwardly from the peripheral surface of the cavity and carry on the radially inner extremities thereof part-cylindrical bearing surfaces which lie on an imaginary cylinder coaxial with the longitudinal axis of the cavity. Each bearing surface is provided with an elongated cutting edge, there being at least two cutting edges disposed substantially diametrically opposite each other. The bits are circumferentially spaced apart to provide chip clearances therebetween, the cutting edges in cross-section being defined by apices of V-shaped portions on the bits, respectively. The cutting edges are disposed in radially overlying relationship with adjacent portions of the clearances, respectively. The cross-sectional portions of the cavity peripheral surface which merge with the bits are curved such that chips may feed smoothly and without interference from the cutting edges into the clearances. This tool can be used for high speed production of parts which are turned to close tolerances.

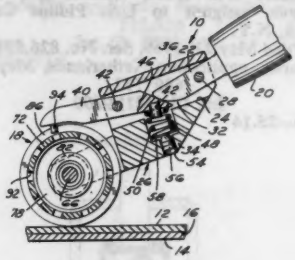
3,611,527
MOUNTING FOR TOOL BITS
Arthur F. Hudson, P.O. Box 1025, Huntington, Ind. 46750
Original application June 8, 1966, Ser. No. 575,200, now Patent No. 3,497,934, dated Mar. 3, 1970. Divided and this application Oct. 27, 1969, Ser. No. 869,542
Int. Cl. B26d *1/00, 1/12*
U.S. Cl. 29—98 **2 Claims**



I propose an adjustable mounting for tool bits which includes a pocket of a size which can be adjusted in order to position the tool bit, this being by means of a movable element within the pocket in the form of a wedge which provides one locating surface for the tool bit, and additional locating surfaces for the tool bit which will provide a back-up for the tool bit regardless of its adjusted position whereby the tool bit is held against movement in its adjusted position, and a hold down device which retains the tool bit within the pocket at its desired position.

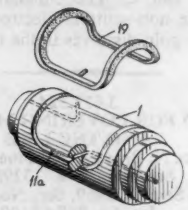
3,611,528
CONTROLLED PRESSURE ROLLER
Christopher James Lance, Royal Oak, Mich., assignor of fractional part interest to Ivan F. Belknap, Detroit, Mich.
Filed May 4, 1970, Ser. No. 34,424
Int. Cl. B05c *1/08*
U.S. Cl. 29—110.5 **8 Claims**

A controlled pressure roller is provided for applying rolling pressure of a predetermined minimum value onto a surface. The roller structure includes a manually engageable handle and a roller element. Resiliently biased latching means are provided to engage the roller and prevent rotation thereof until sufficient pressure is applied by means of the handle with the roller element in engagement with a surface to cause disengagement of the latching means and permit rolling of the roller element over the



surface with the predetermined minimum pressure being applied.

3,611,529
EXPANDABLE SEAL FOR A CONTROLLED DEFLECTION ROLL
Peter Hold, Milford, and Dominic A. D'Amato, Cheshire, Conn., assignors to Farrel Corporation, Ansonia, Conn.
Filed Aug. 28, 1967, Ser. No. 663,595
Int. Cl. B21b *13/00;* **F16c** *13/00*
U.S. Cl. 29—116 **1 Claim**

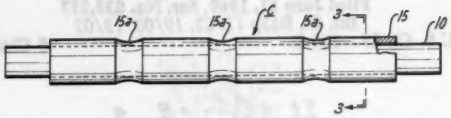


A controlled deflection roll has a non-rotative shaft and a superimposed roll shell with space between the two, end and longitudinally extending seals dividing this space into two compartments into one of which liquid is introduced under pressure so that when the roll shell is working against a counter roll under pressure the deflection of the roll shell is controlled by the pressure on the liquid with consequent opposite beam flexure of the shaft. At least the longitudinally extending seals are hollow and inflatable and are expandable by fluid pressure controlled to provide the sealing pressure desired independently of the pressure of the liquid controlling the deflection of the roll shell.

3,611,530
ANTIPICKUP ROLL CONSTRUCTION AND UTILIZATION FOR PLATING LINES
John T. Mayhew, Box 156, Sunset Drive, Toronto, Ohio 43964
Filed Mar. 19, 1970, Ser. No. 20,945
Int. Cl. B21b *27/02*
U.S. Cl. 29—129.5 **8 Claims**

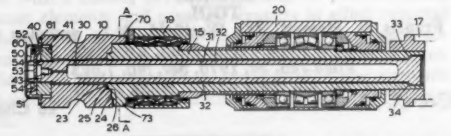
An after-positioned guide roll for a continuous galvanizing line has a specially constructed composite structure comprising a substantially solid main body and a surface-treated protective sleeve thereon which is resistant to pick-up of hot coating material, such as zinc or an alloy of zinc and aluminum that is carried on the surface of a workpiece. The sleeve is given a special heat treatment and

thereafter provided with a highly adherent, relatively finely textured red rust (ferric oxide) on its outer peripheral surface, is securely-mounted in position on the main



body, and has a group of longitudinally spaced-apart, annular groove portions that define fluid flow passageways about the roll.

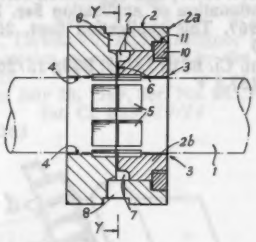
3,611,531
MILL ROLL MOUNTINGS
Nicholas A. Townsend, Bexley Heath, Kent, and Roy R. Oxlade, London, England, assignors to The British Iron and Steel Research Association, Buckingham Gate, London, England
Filed Nov. 14, 1968, Ser. No. 775,840
Claims priority, application Great Britain, Nov. 15, 1967, 52,086/67
Int. Cl. B30b *3/00*
U.S. Cl. 29—129 **8 Claims**



A rolling mill work roll assembly comprising a work roll releasably secured to the free end of a drive shaft. The roll is axially located by means of a forcibly abutted seat and seating surface, each perpendicular to the roll axis, on the roll and shaft. The roll is radially located by means of a co-operating cylindrical spigot and cylindrical recess provided one each on the roll and the shaft. Backlash between the roll and shaft is prevented by engaging key and key-way members provided one each on the roll and the shaft. The forcible abutting of roll and shaft is provided by readily releasable means acting axially only to compress the roll against the shaft, and extending through an axial bore on the work roll.

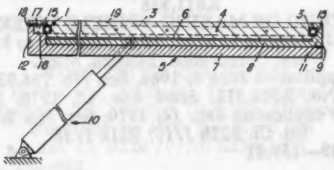
3,611,532
FLUID FEED SLOTS METHOD
Colin William Dee, 2 Frederica Road, Bournemouth, Hampshire, England
Original application Mar. 4, 1968, Ser. No. 710,258, now Patent No. 3,510,176, dated May 5, 1970. Divided and this application Oct. 23, 1969, Ser. No. 871,138
Claims priority, application Great Britain, Mar. 6, 1967, 10,538/67
Int. Cl. B23p *11/00;* **B21d** *53/10;* **F16c** *17/16*
U.S. Cl. 29—149.5 **4 Claims**

A fluid bearing has first and second relatively rotatable bearing members defining a body-of-rotation bearing volume between them, one of said members having therein a plurality of angularly-spaced fluid feed slots each of which opens at one of its ends into the bearing volume. A method of making such slots comprises the steps of providing in said one bearing member two elements each having an exposed face which, when the elements are assembled in said one bearing member, is butted against the



exposed face of the other element, removing material by milling or grinding from at least one of said elements at its exposed face so as to form in said face a plurality of recesses separated by lands and corresponding in position to said slots, lapping said lands so as to obtain a desired depth of recess, and thereafter assembling said elements in said one bearing member with their respective exposed faces abutting so as to define said slots.

3,611,533
METHOD OF MAKING PREFABRICATED BUILDING UNIT
Thomas V. Thomason, Hythe, Kent, England, assignor to The Hythe (Kent) Engineering Company Limited, Hythe, Kent, England
Filed Apr. 3, 1969, Ser. No. 813,215
Int. Cl. B23p *17/00*
U.S. Cl. 29—155 **16 Claims**



A process for making prefabricated units for use in erecting prefabricated buildings comprises forming a structural steel frame, preferably made from tubular steel rectangular frame sections, and placing the frame horizontally in an open topped mould having a flat bottom and vertical sides which are arranged so that the frame can be placed with its outer edges projecting beyond the planes of the sides of the mould and so that the lower face of the frame is clear of and parallel to the flat bottom of the mould. A light weight concrete mix is then poured into the mould so that the mix fills the space between the bottom of the mould and the lower face of the frame and also fills at least part of the space bounded by the frame so that the steel members forming the frame are at least partly embedded in the mix. The mix is then allowed to set and the unit is removed from the mould. The mix is of such a constituency that, on setting, a smooth surface is formed in contact with the bottom of the mould. A unit is thus formed with the outer edges of the frame projecting beyond the concrete in-filling to facilitate the welding together of adjacent units at right angles to each other, and with an inner face which is sufficiently smooth to serve as a ceiling or wall of a room without need of a further finish such as a plaster coating to be applied to the surface.

3,611,534

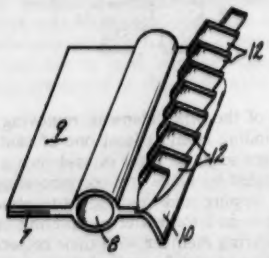
METHOD OF MAKING EXPANDED INTEGRAL FIN SHEET METAL TUBING FOR USE IN HEAT EXCHANGERS

Norval A. Keith, East Alton, Ill., assignor to Olin Corporation

Continuation-in-part of applications Ser. No. 708,463, Dec. 7, 1967, and Ser. No. 774,577, Nov. 1, 1968, now Patent No. 3,495,657, said application Ser. No. 774,577 being a continuation of application Ser. No. 630,376, Apr. 12, 1967. This application Sept. 25, 1969, Ser. No. 860,980

Int. Cl. B21d 53/02; B23p 15/26

U.S. Cl. 29—157.3 V 5 Claims



A sheet metal tubing having integrally formed web sections which are slit to form fins. The fin surface area is increased by corrugating the web sections prior to slitting them into fins. After slitting, the fins are flattened or shaped as desired, and then twisted or bent to form the desired array. The sheet metal tubing may be formed into a variety of shapes such as coils for use in heat exchangers in applications such as refrigerators.

3,611,535

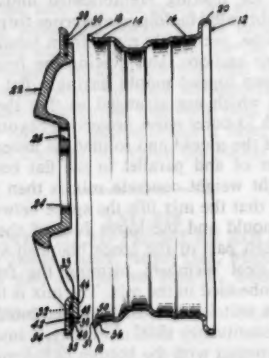
METHOD OF MAKING VEHICLE WHEEL

Edward J. Nobach, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Original application June 6, 1968, Ser. No. 735,039, now Patent No. 3,506,311, dated Apr. 14, 1970. Divided and this application Jan. 14, 1970, Ser. No. 2,781

Int. Cl. B21h 1/10; B21k 1/38

U.S. Cl. 29—159.01 6 Claims



An automotive passenger vehicle wheel comprising a cast aluminum wheel body and a rolled or stamped sheet steel rim rigidly interconnected by a steel ring insert cast into the aluminum body and a continuous welded joint between the steel insert and the rim, the welded joint preferably being formed by a friction or inertial welding process wherein one edge of the rim is rotated against the ring insert.

3,611,536

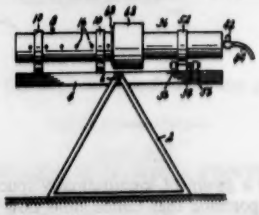
APPARATUS FOR APPLYING EXPANSIBLE SHEATHS TO CORES

Manfred H. Guenther, 6103 E. 151st Terrace, Grandview, Mo. 64030, and Eugene Hayes, Kansas City, Kans.; said Hayes assignor to said Guenther

Filed June 11, 1969, Ser. No. 832,277

Int. Cl. B23p 11/02, 19/00, 19/02

U.S. Cl. 29—200 B 5 Claims



An apparatus for applying a rubber or other resiliently expansible sheath to a core member, said sheath having a normal interior diameter less than the diameter of said core, said apparatus consisting of seals for closing the ends of said sheath, whereby air under pressure introduced therein will expand said sheath to an internal diameter greater than the core diameter, and mechanism for introducing said core into said sheath while the latter is so expanded whereby when said pressure is relieved said sheath will contract resiliently into snug engagement with said core.

3,611,537

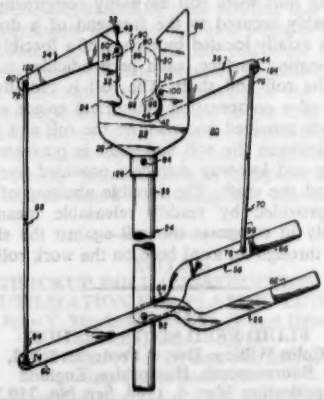
TOOL

Francis S. Hassett, Jr., Westfield, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Jan. 30, 1970, Ser. No. 7,063

Int. Cl. H01r 43/04; H05k 13/00

U.S. Cl. 29—203 D 18 Claims



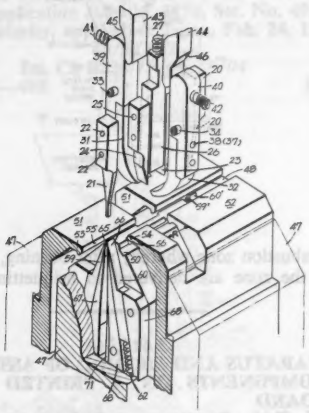
A tool, comprised of a handle member and a contoured head member coupled thereto, remotely operated compression means coupled to the head member, and operating means coupled between said compression means and said handle member for compressively deforming appropriate tabs of a connecting device positioned within the head member.

3,611,538

APPARATUS FOR CONTINUOUSLY PRODUCING A SLIDE FASTENER CHAIN

Ikuo Takamatsu, New York, N.Y., assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Original application July 23, 1968, Ser. No. 746,952, now Patent No. 3,540,090, dated Nov. 17, 1970. Divided and this application June 25, 1970, Ser. No. 49,889
Claims priority, application Japan, Feb. 24, 1968, 43/11,657
Int. Cl. B23p *19/04*
U.S. Cl. 29—207.5 D 1 Claim



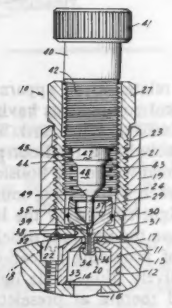
An apparatus for producing slide fastener chains comprises a base unit and an overhead unit overlying the base unit. The base unit is provided with a longitudinally extending recess for guiding the fastener chains and a pair of grippers for gripping the chains. The overhead unit is provided with a cutting device for cutting off predetermined fastener elements and a set of scrapers to effect removal of the cut off elements. The base and overhead units cooperate together to form longitudinally spaced-apart blank portions on the fastener chain devoid of fastener elements to thereby facilitate the mounting of sliders on the fastener chain.

3,611,539

DIE EXTRACTOR

John A. Meaden, Jr., 635 S. Park, Hinsdale, Ill. 60521

Filed June 16, 1969, Ser. No. 833,358
Int. Cl. B23p *19/04*
U.S. Cl. 29—253 10 Claims



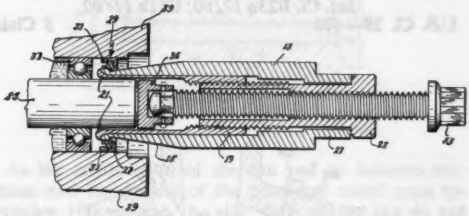
A tool for extracting a die from a mounting recess in a holder, having a thrust member engageable with the holder adjacent to the recess, an extraction device engageable with the die, and reaction power structure operable on and between the member and the device to effect die-extracting movement of the device relative to the thrust member to withdraw the die from the recess as the member thrusts against the die holder.

3,611,540

SEAL PULLER

Tadashi Gibu, Tachikawa, Japan, assignor to the United States of America as represented by the Secretary of the Air Force

Filed July 28, 1969, Ser. No. 845,364
Int. Cl. B23p *19/04*
U.S. Cl. 29—263 2 Claims



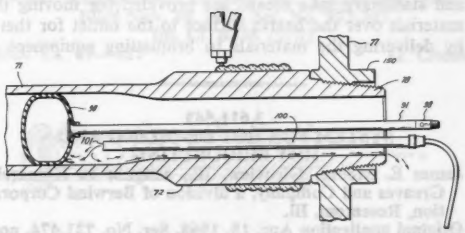
A puller for extracting a sealing element from the housing of an aircraft accessories case having a drive shaft extending outwardly therefrom. The puller includes a hollow draw collet member with flexible finger elements which are positioned behind the seal and which move radially outward in response to the relative axial movement of a collet spreader to engage the inside circumference of the steel case of the seal. The tightening of a drive bolt against the end of the drive shaft then pulls the seal from the housing.

3,611,541

TOOL JOINT REBUILDING

William R. Garrett, Midland, Tex., assignor to Smith International, Inc., Drilco Division, Midland, Tex.

Filed Jan. 30, 1970, Ser. No. 7,016
Int. Cl. B22d *19/10*; B23p *7/00*
U.S. Cl. 29—401 5 Claims



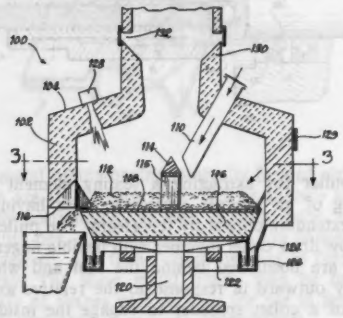
The outer periphery of a worn down tool joint on the end of a drill pipe is restored to desired diameter by applying a weld bead to the outer periphery of the tool joint, the joint being rotated and the weld rod periodically, i.e. once each revolution, translated, the width of one weld bead, parallel to the joint axis, during application of the weld metal. Cooling of the joint during welding is effected by plugging the pipe interior adjacent the tool joint and admitting water to the pipe adjacent the plug, the water

flowing back through the tool joint and out the end of the pipe. An open air tank receives the hot water from the pipe. The water cools in the tank and is recirculated by a pump back into the pipe adjacent the plug. The plug is an expandable bladder carried on the end of a compressed air pipe by means of which the bladder is inserted through the internal upset of the pipe and expanded.

3,611,542
SYSTEM FOR HOT DE-OILING AND HOT BRIQUETTING

James E. Moore, Glenview, Ill., assignor to Komarek-Greaves and Company, a division of Berwind Corporation, Rosemont, Ill.

Original application Apr. 15, 1968, Ser. No. 721,474, now Patent No. 3,497,190, dated Feb. 24, 1970. Divided and this application Dec. 18, 1969, Ser. No. 886,158
Int. Cl. B23q *17/00*; C21b *11/00*
U.S. Cl. 29—403 **5 Claims**



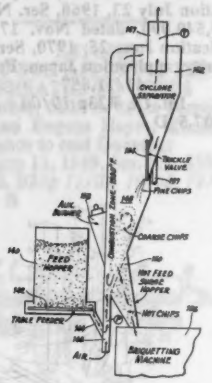
A system for hot de-oiling and hot briquetting material wherein the material is heated to burn off or vaporize foreign substances and is then transported to a briquetting machine for forming of the material into briquets. The improvements of the invention relate to a furnace construction and method of operation for heating the material. The furnace construction includes a single rotating hearth providing a combustion zone whereby the material can be fed to the combustion zone from an inlet designed to deliver the material to the center of the hearth. An outlet is defined in the side of the furnace construction, and stationary rake means are provided for moving the materials over the hearth surface to the outlet for thereby delivering the materials to briquetting equipment.

3,611,543
SYSTEM FOR HOT DE-OILING AND HOT BRIQUETTING

James E. Moore, Glenview, Ill., assignor to Komarek-Greaves and Company, a division of Berwind Corporation, Rosemont, Ill.

Original application Apr. 15, 1968, Ser. No. 721,474, now Patent No. 3,497,190, dated Feb. 24, 1970. Divided and this application Dec. 18, 1969, Ser. No. 886,161
Int. Cl. B23g *17/00*; C21b *11/00*
U.S. Cl. 29—403 **7 Claims**

A system for hot de-oiling and hot briquetting material wherein the material is heated to burn off or vaporize foreign substances and is then transported to a briquetting machine for forming of the material into briquets. The improvements of the invention relate to a furnace construction and method of operation for heating the material. The furnace construction includes a combustion area with material being fed to the combustion area from a bottom inlet. The material is carried through the inlet by means of an air stream and an outlet is defined in

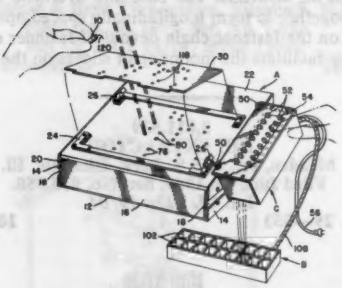


the combustion zone whereby after burning, the materials within the zone are delivered to briquetting equipment.

3,611,544
APPARATUS AND METHOD OF ASSEMBLING COMPONENTS ON A PRINTED CIRCUIT BOARD

Dale E. Frels, Barstow, and Richard A. De Lille and Robert W. Samuelson, Moline, Ill., and James R. Lindsay, Bettendorf, Iowa, assignors to Gulf + Western Industries, Inc., New York, N.Y.

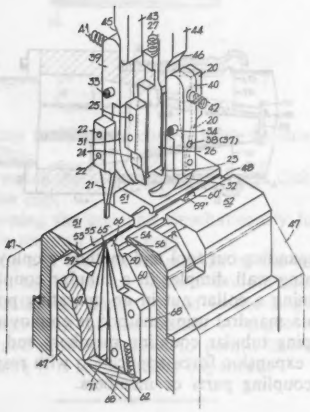
Filed Jan. 28, 1970, Ser. No. 6,533
Int. Cl. B23q *17/00*; H05k *13/04, 3/30*
U.S. Cl. 29—407 **11 Claims**



This invention relates to an apparatus and method of assembling electrical components having leads in selected openings on a printed circuit board. The apparatus comprises a housing including a read-out panel, a plurality of light sources disposed within the housing, means for selectively energizing each of the light sources and means for transmitting the light emitted by the light sources to preselected positions on the read-out panel. The method comprises the steps of providing a read-out panel having a plurality of selectively illuminable light emitting sources releasably secured thereto at preselected locations, each of the locations defining the relative position of a corresponding electrical component; positioning the printed circuit board on the read-out panel with some of the openings in alignment with some of the light emitting sources;

selectively illuminating the light emitting sources; and inserting the leads of the corresponding electrical component in the respective openings of the printed circuit board as indicated by said light emitting sources.

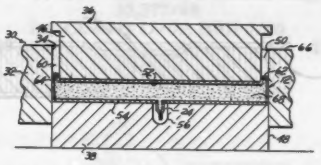
3,611,545
METHOD FOR CONTINUOUSLY PRODUCING A SLIDE FASTENER CHAIN
Ikuo Takamatsu, New York, N.Y., assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan
Original application July 23, 1968, Ser. No. 746,952, now Patent No. 3,540,090, dated Nov. 17, 1970. Divided and this application June 25, 1970, Ser. No. 49,890
Claims priority, application Japan, Feb. 24, 1968, 43/11,657
Int. Cl. B23p *15/00, 19/04*
U.S. Cl. 29—408 **1 Claim**



A method for producing slide fastener chains comprises providing a pair of opposed carrier tapes each having therealong a row of fastener elements secured to the carrier tapes by sewing threads and then removing longitudinally spaced-apart groups of the fastener elements so that sliders may be easily mounted on the carrier tapes to thereby form slide fastener chains. The groups of fastener elements are removed by punching out the coupling portions of adjacent intermeshed fastener elements and cutting the sewing threads securing these fastener elements to the carrier tapes thereby forming a blank tape portion devoid of fastener elements.

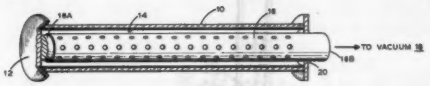
3,611,546
METHOD OF HIGHLY-DENSIFYING POWDERED METAL
John Haller, Northville, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.
Filed Nov. 26, 1968, Ser. No. 779,151
Int. Cl. B22f
U.S. Cl. 29—420 **14 Claims**

An air-tight can is prepared from heat-resistant material, such as ordinary steel or stainless steel having on at least one end a tubular stem through which the can is filled with the powdered metal to be compacted. The interior of the can is then exhausted to a high vacuum by connecting the stem to a vacuum pump, whereupon the stem is sealed off as by welding while maintaining the high vacuum. The thus powder-filled evacuated can is then heated to a high temperature which in one example was 2150° F. for about one hour. While at that heat it is placed in the die cavity of a press with the stem projecting into a sufficiently deep recess in either the lower punch or in the upper punch. The upper punch (and in a modification also the lower punch) is made of smaller diameter than the die cavity so as to leave an annular clearance space between the side wall of the die cavity and the punch. The upper punch is then lowered into the die cavity in a pressing stroke which flattens the can while compressing the metal powder therein without rupturing the can or lowering the vacuum therein.



As the compression of the can and its contents continues, and the density of the powdered metal mass approaches 100 percent, the side walls of the can do not collapse, buckle or crinkle, as has hitherto occurred in prior attempts at compressing powdered metals within cans. Instead, the peripheral portion of the can and its contents deform axially into the clearance space between the punch and the die cavity side wall. If the pressing is continued until the density exceeds 100 percent, the surplus metal powder and the peripheral portion of the can continue to move axially into the above-mentioned clearance space, thereby producing an axially-projecting lip extending around the periphery of the can and containing metal powder at a somewhat lower density than the metal in the remaining portion of the can. The walls of the can are then removed by machining or by pickling, together with the less dense peripheral portion of the now substantially solidified metal disc or "pancake."

3,611,547
METHOD AND DEVICE FOR REMOVING MEMBRANES FROM TUBULAR SUPPORTS
Raymond M. Chappel, Whippany, N.J., assignor to Abcor Water Management Company, Inc., Cambridge, Mass.
Filed Nov. 20, 1968, Ser. No. 777,307
Int. Cl. B23p *19/02*
U.S. Cl. 29—427 **11 Claims**



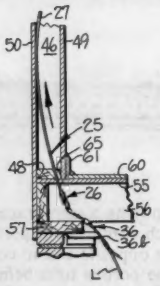
A device for removing a membrane from a tubular support therefor which comprises a porous tube having one end sealed and the opposite end in communication with a vacuum source, the porous tube being adapted for insertion within the tubular support such that the membrane circumscribes the porous tube. Associated with the device is a method for removing the membrane liners from the tubular support which involves inserting a porous tubular member within the membrane liner housed in the tubular support, pulling a vacuum on the porous tubular member thereby causing collapse of the membrane against

the porous tube tubular member, and removing the porous tubular member and the membrane from the tubular support.

3,611,548
PANEL CONSTRUCTION AND METHOD
Peter P. Parris, Costa Mesa, Calif., assignor to Tridair Industries, Redondo Beach, Calif.
Original application Apr. 12, 1967, Ser. No. 632,714. Divided and this application June 18, 1969, Ser. No. 844,711
Int. Cl. B23p *19/00*
U.S. Cl. 29—428 **16 Claims**

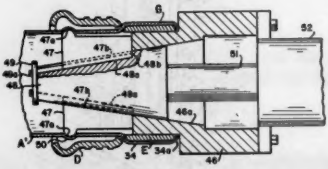
The method as disclosed herein includes applying a compressive force to the faces of a sandwich panel in excess of the crushing proportional limit of the sandwich panel and below the force at which the panel structurally fails and substantially weakens to permanently reduce the thickness and increase the density of the core of the sandwich panel. The compressive force is applied along a preselected zone such as a marginal portion of the sandwich panel to reduce the thickness thereof while allowing the thickness of the main portion of the panel to remain substantially unchanged. The portion of reduced thickness is integrally joined to the remainder of the panel by a tapered transition portion. A suitable accessory member such as an edge member or a joining member is then secured to the marginal portion to increase the strength of and protect the marginal portion. The panels may be used for various purposes such as pallets.

3,611,549
METHOD FOR FORMING HOLES IN AND INSTALLING LINES IN STRUCTURAL MEMBERS
George F. Pope, Burlington, N.C., assignor to Diversified Manufacturing & Marketing Co., Inc., Burlington, N.C.
Filed July 1, 1969, Ser. No. 838,270
Int. Cl. B23p *19/04*
U.S. Cl. 29—433 **10 Claims**



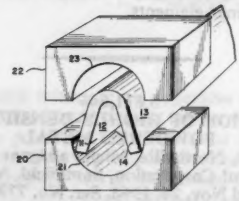
Holes for electrical conductor lines and the like are formed through oftentimes inaccessible wooden obstructions, such as structural frame members of a hollow wall, by utilizing a novel drill having an elongate spring-like shaft with a drill bit on its leading end, and wherein the shaft may be bowed to insert the same into the wall to direct the drill bit in the desired direction. The method further comprises connecting a pliable line (a pull line or conductor line) to one end of the drill after it has passed through the wall, and then removing the drill while pulling the line therewith to position a length of the pliable line extending through the wall.

3,611,550
PROCEDURE FOR MAKING QUICK ASSEMBLY COUPLING
Clyde E. Rickard, Du Bois, Pa., assignor to McDowell Manufacturing Company, Millvale, Pa.
Original application Feb. 28, 1969, Ser. No. 803,382, now Patent No. 3,564,897, dated Feb. 23, 1971. Divided and this application Apr. 16, 1970, Ser. No. 29,038
Int. Cl. B21d *39/00;* **B23p** *11/00*
U.S. Cl. 29—511 **4 Claims**



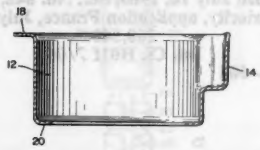
An expanding-out tool and method employs a mandrel for forming wall dimples in a tubular coupling member for retaining a collar nut in an operating position thereon. Also a mandrel using method is employed for expansion-shaping tubular coupling members and for securing them by expansion force application with respect to other hollow coupling parts or members.

3,611,551
METHOD FOR ATTACHING SUTURE AND NEEDLE
William H. Shave, Roosevelt, and Leonard D. Kurtz, Woodmere, N.Y., assignors to Deknatel, Incorporated, Queens Village, N.Y.
Filed Aug. 25, 1969, Ser. No. 852,785
Int. Cl. B21d *39/00;* **B23p** *11/00*
U.S. Cl. 29—515 **6 Claims**



A method of attaching a suture to a suture needle of the type initially having a V-shaped cross-section channel while substantially eliminating annealing. The channel is forcefully partially closed before hardening the needle, after which the needle is hardened, after which suture is placed into the channel. The walls of the channel are then further and finally closed against each other normally without annealing, to hold the suture.

3,611,552
COLD DRAWING A DISK INTO A CAP FOR PAPER CORE
Philip S. Cushing and Harris E. Stone, both of 293 Lenox St., Norwood, Mass. 02068
Continuation-in-part of abandoned application Ser. No. 746,154, July 19, 1968. This application Mar. 9, 1970, Ser. No. 17,638
Int. Cl. B21d *39/04*
U.S. Cl. 29—523 **1 Claim**



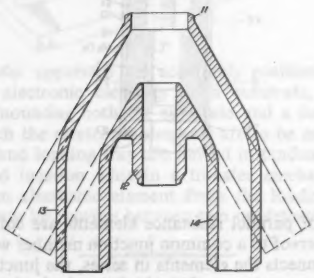
A metal cap for a paper core is made by three operations:

(1) Depressing the central area of a steel disk to form a shallow cup;

(2) Deepening the cup and simultaneously forming a socket in the wall of the cup;

(3) Cutting out the central portion of the bottom of the cup to leave an inward bottom flange and straightening the flange to add to the length of the cylindrical wall of the object. A slight radius is maintained around the end to permit insertion in a core where it is subsequently expanded.

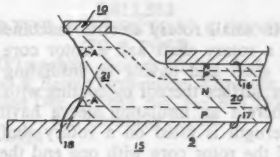
3,611,553
METHOD OF FORMING TUBE JUNCTIONS
Alexander Lightbody, Kilbarchan, Scotland, assignor to Babcock & Wilcox Limited, London, England
Filed May 26, 1969, Ser. No. 827,721
Claims priority, application Great Britain, May 24, 1968, 24,997/68
Int. Cl. B23p *13/04*
U.S. Cl. 29—558 **7 Claims**



A tube junction having a root limb from which extend a plurality of branched limbs, one of which called a first branch limb is in coaxial relation with the root limb while the others are spaced around the axis of this first branch limb. All the branch limbs extend in the same direction and the terminating end portions thereof are in parallel closely pitched relationship with the axis of the first branch limb.

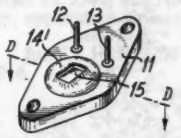
A method of making the aforesaid junction having the sequential steps of forging, boring, and bending into the desired shape.

3,611,554
METHODS OF MANUFACTURE OF SEMICONDUCTOR ELEMENTS AND ELEMENTS MANUFACTURED THEREBY
John Mansell Garrett, London, England, assignor to Westinghouse Brake English Electric Semi-Conductors Limited, London, England
Filed June 27, 1969, Ser. No. 837,183
Claims priority, application Great Britain, Aug. 6, 1968, 37,377/68
Int. Cl. B01j *17/00*; H01l *5/00*
U.S. Cl. 29—580 **19 Claims**



A method of forming a semiconductor wafer from a slice of semiconductor material. Regions of one type of conductivity are formed on a semiconductor slice of the opposite type of conductivity extending inwardly from each of the opposed major faces of the slice thereby to form in the slice a pair of P-N junctions extending parallel to the major faces. Rigid metal members are then secured to the opposed major faces of the slice. Material is then mechanically removed from the peripheral portion of the slice to form a peripheral edge on which the P-N junctions emit and meet at an acute angle on that side of the P-N junction on which lies the original material of the slice. The peripheral edge meets the major faces adjacent the rigid metal members thus providing a protection for the circumferential edges of the wafer in its final form.

3,611,555
METHOD OF ASSEMBLING A SEMICONDUCTOR DEVICE
Johannes Nier, Stuttgart-Weilimdorf, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed Jan. 16, 1970, Ser. No. 3,388
Claims priority, application Germany, Jan. 23, 1969, P 19 03 274.7
Int. Cl. B01j *17/00*; H01l *1/14*
U.S. Cl. 29—591 **10 Claims**



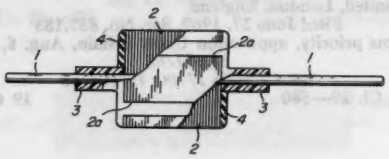
A layer of solder is provided on a surface portion of a carrier. The solder layer is then formed with a depression whose size and outline correspond to the semiconductor element which is to be mounted on the carrier, whereupon the semiconductor element is positioned in the recess and bonded to the carrier by subjecting the solder to requisite thermal energy.

3,611,556

METHOD OF MANUFACTURING A ROTOR FOR SMALL ROTARY ELECTRIC MACHINES

Tamotsu Matsubara, Yoshio Oka, and Kunihiro Nonome, Kariya-shi, Japan, assignors to Nippon Denso Company Limited, Kariya-shi, Japan

Continuation of application Ser. No. 770,046, Oct. 23, 1968. This application Jan. 26, 1970, Ser. No. 5,660
Claims priority, application Japan, Jan. 20, 1968, 43/3,693
Int. Cl. H02k *15/02*
U.S. Cl. 29—598 2 Claims



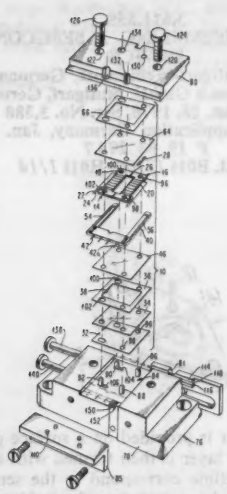
A rotor in small rotary electric machines of the type comprising a rotary shaft and a rotor core mounted on said rotary shaft and having an insulating film formed on the outer surface thereof by coating with an insulating powder, wherein an insulating sleeve having large mechanical sterngth is fitted on a rotary shaft at least on one side of the rotor core with one end thereof contacting the confronting end face of said core before the insulating powder is coated on the opposite end faces of and the surfaces of grooves formed in said core, and which therefore provides for easy production of the sleeve and enables the bonding of the sleeve with the core to be attained in a highly economical manner.

3,611,557

METHOD OF PRODUCING A MAGNETIC TRANSDUCING HEAD

Alfred T. Hardardt, Wappingers Falls, Henry C. Schick, Hopewell Junction, and John H. Westermann, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 2, 1969, Ser. No. 812,723
Int. Cl. H01f *7/06*
U.S. Cl. 29—603 5 Claims



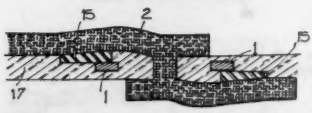
A laminar-like module for use in producing a multiple magnetic transducing head is disclosed, together with a method of fabricating the module. A plurality of separate components are placed in stacked relationship in a fixture, with intervening heat-activatable adhesive sheets. The working gap between the magnetic cores is set, transverse relative movement between the cores is prevented, the coil leads are attached to exposed pads on connector pins, and various tests performed on the module prior to final assembly. If the tests are successful, the components are fastened together by activating the adhesive.

3,611,558

METHOD OF MAKING AN INTEGRATED MAGNETIC MEMORY

Michel Carbonel, Paris, France, assignor to Thomson-CSF

Filed July 16, 1969, Ser. No. 842,111
Claims priority, application France, July 25, 1968, 160,540
Int. Cl. H01f *7/06*
U.S. Cl. 29—604 4 Claims



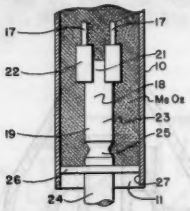
A method of manufacturing integrated magnetic circuits comprising: the deposition by electrolysis of a ferromagnetic material forming a memory core, on a filler metal, which is easily affected by chemical attack; a further deposition on said material of a further layer of the filler metal and the deposition of conductors on this latter layer; and the dissolving of the filler metal with substitution thereto of an insulating material.

3,611,559

METHOD OF MAKING AN ELECTRICAL HEATING UNIT

David D. McKay and Albert S. Gould, Winnipeg, Manitoba, Canada, assignors to James B. Carter, Limited, Winnipeg, Manitoba, Canada

Filed Oct. 10, 1969, Ser. No. 865,312
Int. Cl. H06b *3/00*
U.S. Cl. 29—611 1 Claim

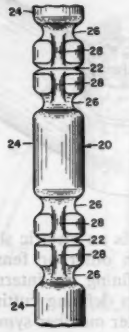


A pair of parallel resistance elements are connected at one end thereof to a common junction member which electrically connects the elements in series, the junction member having an outer portion adapted to be broken off. The elements and the junction member are inserted in a tubular sheath and a washer is placed on the break-off portion of the junction member to hold it centralized in the sheath which is then filled with insulating material and is swaged to compact the insulation. The outer portion of the junction member is then broken off and is removed with the washer from the sheath. The end of the sheath is then sealed by a closure.

3,611,560
METHOD FOR FORMING AN ELECTRO-CONDUCTIVE COATING RESISTOR

Guenter H. Loose, Webster, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Original application Dec. 27, 1968, Ser. No. 787,530, now Patent No. 3,544,948, dated Dec. 1, 1970. Divided and this application Dec. 1, 1969, Ser. No. 881,186
Int. Cl. H01c 7/00, 17/00
U.S. Cl. 29—620 6 Claims

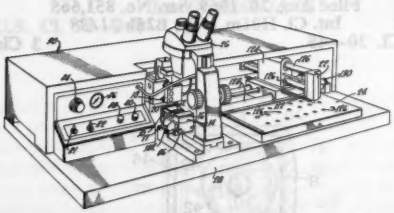


A capless electroconductive coating resistor forming method. The resistor dielectric substrate is formed on a continuous basis, passed between forming rolls to impart therein grooves and notches, coated with resistive material, and thereafter separated into individual resistor blanks. Wire leads are attached directly to the blanks by wrapping them about the blanks within the preformed grooves and in electrical contact with the resistive material coating.

3,611,561
TRANSFER MECHANISM WITH LOADING NEST

Paul A. Dosier, Costa Mesa, Calif.
(2302 Fairhill Drive, Newport Beach, Calif. 92660)

Filed Apr. 21, 1969, Ser. No. 817,998
Int. Cl. H05k 3/30, 13/04
U.S. Cl. 29—626 26 Claims



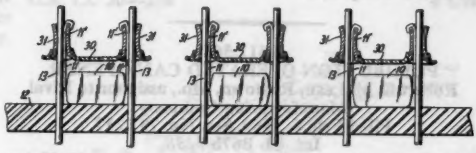
A transfer apparatus for accurately positioning a plurality of electronic elements on a substrate, having a base for mounting both the substrate and a loading tray from which the electronic elements are to be moved. The substrate and loading tray are moved in tandem to a predetermined location wherein a transfer mechanism may transfer an electronic element from the loading tray to the substrate by moving between two predetermined positions.

3,611,562
METHOD OF ATTACHING MICROCIRCUIT PACKS TO A PANEL BOARD

Philip J. Herb, Somerville, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Dec. 5, 1969, Ser. No. 882,576
Int. Cl. H05k 3/30; H01r 43/00
U.S. Cl. 29—626 6 Claims

A method of mass connecting a plurality of microcircuit packs to the printed circuit panel comprises loosely fastening a row of integrated circuit packs to a plurality of crimpable electrical connectors carried by a carrier strip. The carrier strip is then placed over the upstanding pins in the circuit panel such that the upstanding pins also

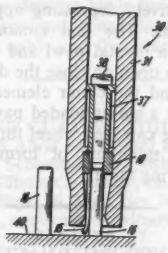


extend through the respective electrical connectors. Using a mass crimping technique, the electrical connectors are crimped thereby forming a mechanical and electrical connection between the integrated circuit packs and the upstanding pins.

3,611,563
METHOD FOR CONNECTING A CONDUCTOR TO A POST

Francis A. O'Loughlin, Scotch Plains, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Dec. 3, 1969, Ser. No. 881,783
Int. Cl. H02g 15/08
U.S. Cl. 29—628 1 Claim

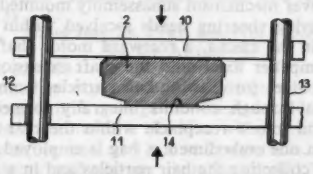


The connector is constructed of a substantially rectangular cross-sectional shape with a bore and a recess passing therethrough so as to initially receive the post and conductor respectively therein with slight clearances. Additionally, the connector is provided with a pair of protrusions on opposite sides so that upon crimping of the protrusions against the connector, the material of the connector flows in transverse perpendicular planes to close upon the conductor and post while obtaining a gas tight fit between the conductor, connector and post.

3,611,564
ENCASING PROCESS FOR PRESS ELECTRODE SEMICONDUCTOR COMPONENTS

Francis H. Boulet, Bures-sur-Yvette, and Roger H. Balteaux, Athis-Mons, France, assignors to Compagnie Generale d'Electricite, Paris, France

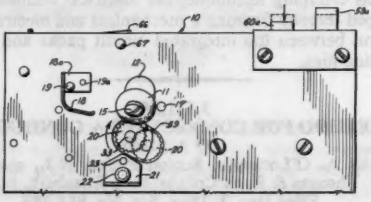
Filed Apr. 15, 1969, Ser. No. 816,255
Claims priority, application France, Apr. 17, 1968, 148,424
Int. Cl. H01r 9/00
U.S. Cl. 29—630 A 4 Claims



An encasing process for press electrode semiconductor components consisting of making the electrodes undergo

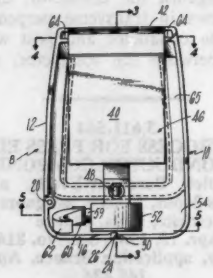
prestress at a pressure higher than that which they would have to undergo during normal operation before placing them on the component and polishing the surfaces of the electrodes which are to be applied to the semiconductor component.

3,611,565
PUSHBUTTON OPERATED CAN OPENER
Robert E. McLean, Raytown, Mo., assignor to Rival Manufacturing Company
Filed Feb. 6, 1969, Ser. No. 797,217
Int. Cl. B67b *7/38*
U.S. Cl. 30—4 18 Claims



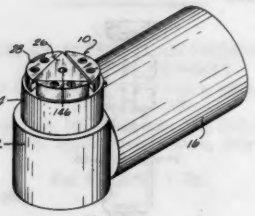
An electrically powered can opener is automatically operated by selectively depressing appropriate finger operated pushbuttons. The first embodiment utilizes the toggling effect of a pivotal pawl and orbiting feed wheel drive shaft pins to open or close the distance between the can feed wheel and the cutter element. The second embodiment includes a spring loaded pawl leg that cushions the advance of the can feed wheel through the can piercing zone with a minimum of torque required by the electric motor driving same.

3,611,566
ELECTRIC SHAVER WITH VACUUM COLLECTOR
William J. Brennan, Sr., 652 Flatbush Ave., West Hartford, Conn. 06110
Filed July 1, 1969, Ser. No. 838,288
Int. Cl. B26b *19/44*
U.S. Cl. 30—41.5 6 Claims



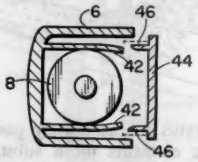
An electric shaver comprising a molded plastic casing and a shaver mechanism subassembly mounted within the casing having shearing heads received within a forward opening in the casing, a rearward motor shaft extension and an impeller fixed onto the shaft extension. The impeller provides for drawing hair particles from the shearing heads through conduits integrally formed with the casing and into a receptacle within the rear end of the casing. In one embodiment a bag is employed as a receptacle for collecting the hair particles and in a second embodiment a pair of rear compartments integrally formed with the casing provide for collecting the hair particles.

3,611,567
CENTRIFUGAL DRIVE FOR ELECTRIC RAZOR
Bertram F. Crane, 2417 N. 59th St., Milwaukee, Wis. 53210
Filed Apr. 14, 1969, Ser. No. 815,962
Int. Cl. B26b *17/04, 19/08*
U.S. Cl. 30—41.9 9 Claims



Disclosed herein is an electric shaver having a shaving head comprising an outer or female member having a polygonal bore defining an internal bearing surface, a number of segments defining cutting elements adjustably mounted on the outer member symmetrically with respect to the bore, an inner or male member supported on the outer member and having a peripheral polygonal bearing surface positioned within said bore and a cutting edge positioned to operatively engage the cutting elements of the segments, an electric motor and a variable radius eccentric drive assembly operatively connected to the motor and to the inner member to provide a polygonal tracing movement of the inner member relative to the outer member. A sharpening device is also included and is adapted to be mounted on the inner member to sharpen the segments or on the segments to sharpen the inner member.

3,611,568
VIBRATORY SAFETY RAZOR
Ben H. Alexander, Brookline, Joseph E. Koehler, Norwell, and Roger L. Perry, Lynnfield, Mass., assignors to The Gillette Company, Boston, Mass.
Filed Aug. 20, 1969, Ser. No. 851,665
Int. Cl. H01m *1/04;* B26b *21/38*
U.S. Cl. 30—45 3 Claims

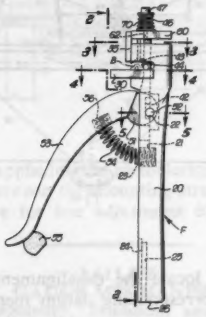


A safety razor including a head portion in which there is mounted cutting means and a handle portion in which there is mounted an electric motor, a shaft rotatable by the motor, and a weight eccentrically mounted on the free end of the shaft, rotation of the weight operating to cause vibration of the head portion of the razor.

3,611,569
KEY DUPLICATING MACHINE
Horst W. Wich, 816 Brent, South Pasadena, Calif. 91030
Filed July 16, 1969, Ser. No. 842,186
Int. Cl. B26b *13/22*
U.S. Cl. 30—131 14 Claims

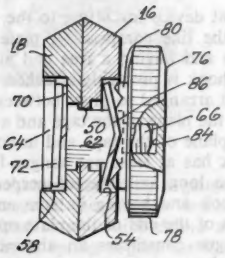
An original key is placed in a recess having associated scale markings on its side edges which indicate the longitudinal positions of notch locations on the key. A key

blank is supported in a selected longitudinal position on a holding jaw, and a cutter bar is moved perpendicularly past the holding jaw to form a notch in the key blank. Scale markings on the holding jaw are used to visually determine the correct position of the key blank as each notch is being formed. After the correct position of the key blank is visually determined by concurrent reference to a corresponding notch location on the original key,



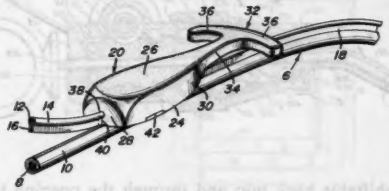
hand operation of an actuating means causes initial movement of the cutter bar to first grasp the key blank firmly in position through an associated holding finger, and then further movement of the cutter bar results in the notching operation. The cutter bar is disposed in an elongated guideway within the frame, and positively retained to prevent misalignment of the cutting edge during a notch forming operation. An eccentric cam with associated operating handle drives the cutter bar relative to the frame.

3,611,570
ADJUSTABLE SCISSORS AND SHEARS WITH HAND DIAL REGULATOR
I. Marco Levi Laurenti, 432 Park Ave. S., New York, N.Y. 10016
Filed Apr. 24, 1969, Ser. No. 818,931
Int. Cl. B26b *13/28*
U.S. Cl. 30—268 **2 Claims**



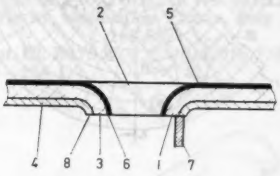
A pair of scissors having a pair of blades enlarged at one end, the enlargements continuing into handle portions. The enlarged ends of the blades are pivotally and adjustably connected to each other. The pivotal and adjustable connection includes a pivot pin extending through aligned holes in the enlarged head portions of the blades, with its threaded end protruding outwardly of the enlarged head portion of the adjacent blade. A knob having a threaded socket is threadedly mounted on the threaded end of the pivot pin whereby turning of the knob adjusts the squeezing tension of the blades on the material being cut.

3,611,571
SUPPORT WIRE STRIPPING TOOL
William F. Belling, 3214 S. 28th St., La Crosse, Wis. 54601
Filed Oct. 30, 1969, Ser. No. 872,616
Int. Cl. H02g *1/12*
U.S. Cl. 30—280 **6 Claims**



A readily applicable and expeditiously manipulable hand tool which lends itself to practical use in the telephone industry. It enables the user to cleave and strip off the usual web attached, but severable, support wire of a plastic jacketed telephone cable. An elongated head has a surface provided at a rearward end with an offset T-shaped handle. Appropriate slot means accommodatingly pockets the covered support wire and its cable attaching web. The cleaving blade has a cutting edge bridging the slot means and comes into play as the tool is pulled along the cable and the attached support wire.

3,611,572
PERFORATED CUTTING FOIL OR PLATE FOR SHAVERS AND METHOD FOR MAKING
Bodo Futterer, Schonbuhlring, Switzerland, assignor to The Gillette Company, Boston, Mass.
Filed Sept. 16, 1968, Ser. No. 760,011
Claims priority, application Switzerland, Sept. 15, 1967, 13,053/67
Int. Cl. B26b *19/04*
U.S. Cl. 30—346.51 **2 Claims**

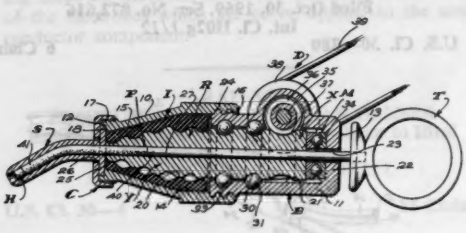


A cutting foil for dry shavers in which a bearing metal is provided on the underside thereof to minimize wear and friction between the foil and a cutter blade, and the method of making such a foil.

3,611,573
AMALGAMATOR
Don L. Crawford, San Gabriel, and Georges A. Maxwell, Los Alamitos, Calif. (both % Georges A. Maxwell, Esq., 1208 Pershing Square Bldg., Los Angeles, Calif. 90013)
Filed July 28, 1969, Ser. No. 845,249
Int. Cl. A61c *5/04*
U.S. Cl. 32—60 **10 Claims**

A manually engageable and manipulatable device for triturating dental amalgams which includes a pugmill with a helical rotor in a chamber with a central discharge opening at one end an a manually operable, axially shiftable valving and plunger member carried by the rotor to normally project into and close the opening to cause

continuous mixing of the ingredients, shiftable from said opening to permit flow of ingredients into the opening

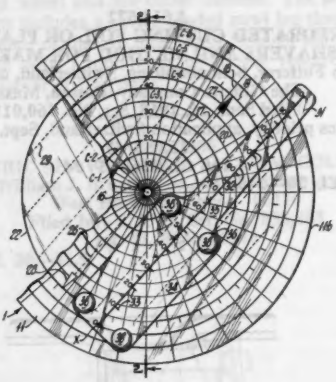


and shiftable back into and through the opening to dispense the ingredients.

3,611,574
VORTAC PLOTTER AND METHOD OF NAVIGATION

Richard E. Young, deceased, late of Rocky Hill, N.J., by Florence E. Young, Rocky Hill, N.J. 08553, Grace H. Stokes, 53 Harrop Place, Trenton, N.J. 08618, and First Trenton National Bank, 1 W. State, Trenton, N.J. 08608, executors

Filed Dec. 30, 1969, Ser. No. 870,664
Int. Cl. B43l *13/20*
U.S. Cl. 33—1 SD **1 Claim**



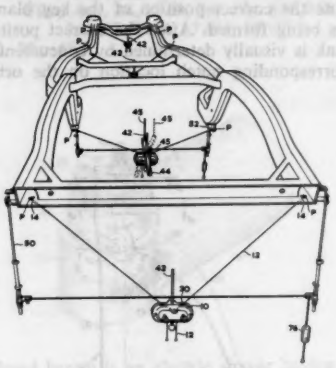
A portable device for mechanically correlating distance and directional information and a method of navigation employing the device. The device and method are especially useful for aircraft navigation based on radio range and direction signals. Two superimposed discs rotatable about a common central axis bear polar coordinate and other indicias, and a track scale is universally fixable on the upper disc for direct reading of the range and direction results calculated.

3,611,575
AUTO FRAME ALIGNMENT APPARATUS

Guy N. Chartier, Hill, Ontario, Canada, assignor to Guy Chart Tools Limited, Scarborough, Ontario, Canada

Filed Apr. 17, 1969, Ser. No. 817,088
Int. Cl. G01c *15/12*
U.S. Cl. 33—46 AT **2 Claims**

A plurality of datum members are sling suspended from respective pairs of locations on a frame which would be equally spaced from the center line and from the front or back of the frame if the frame is symmetrical about a vertical plane therethrough (i.e. if the frame is misaligned). If not, indicators on the datum members



demonstrate and locate the misalignment through their relationship to corresponding datum members.

3,611,576
ATTACHMENT DEVICE FOR FITTING TO THE END OF A MEASURING TAPE OR THE LIKE

Andre Quenot, Besancon, France, assignor to Quenot & Cie S.a.r.l., Besancon, France

Filed Sept. 22, 1969, Ser. No. 859,803
Claims priority, application France, Nov. 7, 1968, 172,852
Int. Cl. G01b *3/10*
U.S. Cl. 33—137 **6 Claims**

An attachment device for fitting to the end of a measuring tape or the like comprises a plate fixable to the end of the tape and having a free end adjacent the end of the tape. A hook is pivotably attached to the free end of the plate and arranged to pivot between an open position inclined to the plane of the tape and a closed position parallel to the plane of the tape and in contact with said plate. The hook has at least one tongue-like portion extending with the long axis thereof perpendicular to the pivot of the hook and having its free end adjacent the plate. A portion of the end of the plate opposite said free end of the tongue constitutes an abutment having surfaces perpendicular to and in contact with the end of said tongue portion of the hook in its respective open and closed positions.

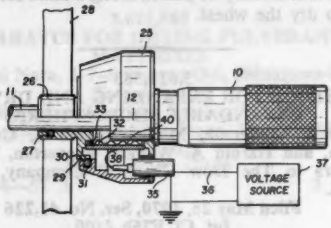
3,611,577
ELECTROMICROMETER

Abbott M. Smith, Webster, N.Y., assignor to Tropel, Inc., Fairport, N.Y.

Filed Jan. 29, 1970, Ser. No. 6,894
Int. Cl. G01b *5/00*
U.S. Cl. 33—166 **18 Claims**

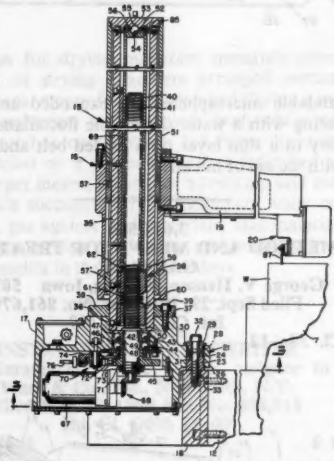
A piezoelectric crystal is arranged between the mounting sleeve of a standard micrometer and an auxiliary

mounting sleeve fixed to a mounting structure, and the dimension of the piezoelectric member is variable in the direction of relative motion of the micrometer spindle so



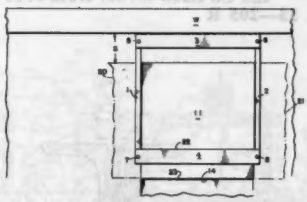
that a voltage applied to the piezoelectric member changes the distance between the mounting structure and the micrometer sleeve for fine adjustment of the micrometer.

3,611,578
GAUGE MECHANISM
John R. Montgomery, Trumbull, and Albert Dunkin, South Norwalk, Conn., assignors to Pneumo Dynamics Corporation, Cleveland, Ohio
Filed Apr. 30, 1969, Ser. No. 820,509
Int. Cl. G01b *5/00*
U.S. Cl. 33—170 **20 Claims**



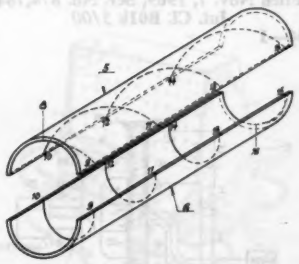
A gauge mechanism including a gauge column having a gauge arm mounted thereon for vertical adjustment by rotation of a lead screw which drives a split or double nut separated by a spring urging the lower nut into engagement with the upper sides of the lead screw threads for supporting the weight of the movable column parts and urging the upper nut into engagement with the lower sides of the lead screw threads for providing a relatively wear-free reference surface for gauging the height of the gauge arm. A gauge head assembly mounted on the outboard end of the gauge arm has a feeler arm attached to a shaft supported in a resilient elastomeric torsion mount permitting a torsion load to be applied to the feeler arm for urging the feeler arm toward a work surface with sufficient force to dampen outward movements of the feeler arm as it rides up over the edge of the work surface and thus prevent over-shoot.

3,611,579
FLOOR TILE MARKING GAUGE
Richard E. Reid, 1002 E. 1st Ave., Albany, Oreg. 97321
Filed Mar. 9, 1970, Ser. No. 17,763
Int. Cl. G01b *5/14*
U.S. Cl. 33—174 G **2 Claims**



An adjustable template and guide frame for marking and cutting a tile to be laid parallel or perpendicular to a marginal straight edge, such as a wall, bounding a zone in which a tile, cut along the guide line provided by the template, is to be laid with respect to an unfilled rectangular space frequently left between the last laid old tile and the marginal edge of a wall or the like, which space is of a similar area to that of the tile being laid. This necessitates that a tile be severed to provide a part which fits into such space between the last laid old tile and the marginal straight edge or wall. To accomplish this, the common practice has been to butt a tile against the wall, overlapping in relation to the last laid tile, scoring a line across the last laid tile at the overlapping edge of the tile butted against the wall, removing the last laid tile and severing it along the line to provide a part equal in area to the space to be filled.

3,611,580
DEVICE FOR CHECKING THE CONFORMITY OF OBJECTS WITH RESPECT TO A MODEL
Jean Godet, Le Mans, France, assignor to Service d'Exploitation Industrielle des Tabacs et des Allumettes, Paris, France
Filed July 15, 1969, Ser. No. 841,722
Claims priority, application France, July 26, 1968, 160,685
Int. Cl. B07c *5/08, 5/10;* G01b *7/00*
U.S. Cl. 33—174 L **2 Claims**

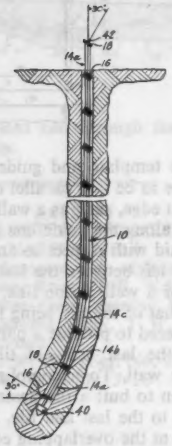


Device for checking the conformity of an object with respect to a model at least at one point of the surface of said object, comprising two movable jaws each adapted to carry at least one electrically conductive element forming part of a same electric circuit, the said jaws being so arranged as to come into contact with each other at one or more checking points and the said electrically conductive elements being mounted on the said jaws so that they are connected to each other and close the said electric circuit when the jaws are in the so-called closed position of contact at the said checking point.

3,611,581
BORE SURVEY INSTRUMENT

Richard Butler, 5679 Edgemore Ave., Cote St. Luc, Quebec, Canada; Vincent Saull, 1 6th St., Roxboro, Quebec, Canada; and Kevin Dwyer, Gardenvale Road, St. Bruno, Quebec, Canada

Filed Apr. 21, 1969, Ser. No. 817,937
Int. Cl. E21b 47/02; G01c 9/00
U.S. Cl. 33—205 R 9 Claims

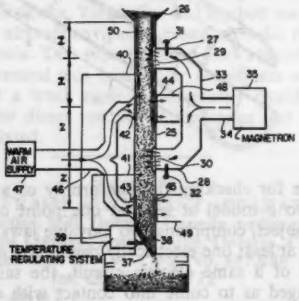


A parallelogram device for maintaining or surveying the dip or azimuth of a bore hole, drill hole, pipes and the like including a plurality of detachable units wherein each unit has a pair of platforms in parallel relationship, a plurality of rods pivoted to each platform maintaining parallelogram structure of each unit.

3,611,582
MICROWAVE PACKAGE FOR CONTROL OF MOISTURE CONTENT AND INSECT INFESTATIONS OF GRAIN

Michael A. Hamid and Roger J. Boulanger, Winnipeg, Manitoba, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Nov. 7, 1969, Ser. No. 874,784
Int. Cl. B01k 5/00
U.S. Cl. 34—1 6 Claims

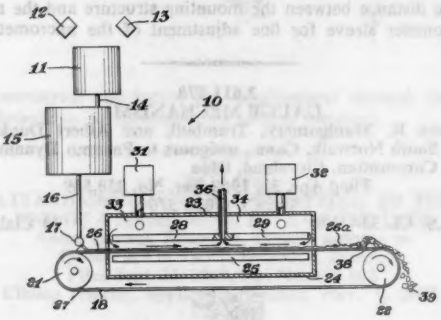


A vegetal substance, for example, wheat, is deinfested by passing the wheat as a filling along a main section waveguide, whilst microwave energy is generated along a branch section waveguide into the wheat. The microwave energy from a magnetron passes along a screw tuner and slotted line, both of which form the branch section and are used to adjust the voltage standing wave ratio to a minimum. Warm air may be passed along a main section waveguide to dry the wheat.

3,611,583
METHOD FOR EXPANDING AND DRYING EXPANDABLE MICROSPHERES

Thomas F. Anderson, Midland, Glen L. Gunderman, Clare, and Harold A. Walters, Beaverton, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 28, 1970, Ser. No. 41,226
Int. Cl. F26b 3/00
U.S. Cl. 34—9 9 Claims

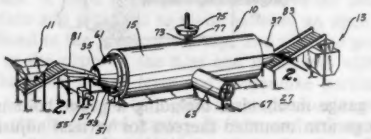


Expandable microspheres are expanded and dried by formulating with a water dispersible flocculant, spreading the slurry in a thin layer on a heated belt and drying the layer with the aid of hot air.

3,611,584
METHOD AND MEANS FOR TREATING GARBAGE

George V. Henson, Zearing, Iowa 50278

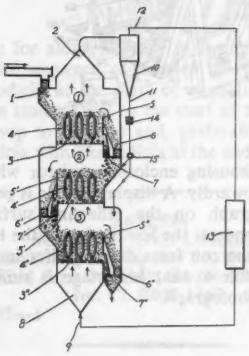
Filed Sept. 29, 1969, Ser. No. 861,679
Int. Cl. F26b 7/00
U.S. Cl. 34—12 2 Claims



A means for treating garbage, comprising a cylindrical perforated tumbler rotatably mounted in an insulated housing. Shredded garbage is fed into one end of the tumbler and is tumbled along the length thereof to its discharge end. Heated air is forced through the tumbled garbage as it passes from one end of the tumbler to the other to dehydrate the same prior to its being discharged from the discharge end of the tumbler into a shredder mill. The air is heated by a flame fired heater means which is positioned outwardly of the housing to prevent the flames thereof from igniting gases which may be produced by the garbage. The tumbler is provided with tumbling or stirring rods mounted therein which enhance the tumbling action

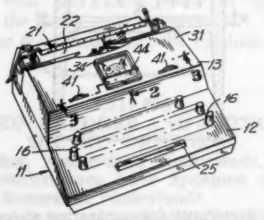
of the garbage. A method of dehydrating the garbage is also disclosed which prevents the ignition of the gases produced by the garbage while efficiently dehydrating the garbage.

3,611,585
APPARATUS FOR DRYING PULVERANT MATERIALS
Jiyuichi Nara, 2–7–8 Higashi-Ooi, Shinagawa-ku, Tokyo, Japan
Filed June 11, 1969, Ser. No. 832,167
Claims priority, application Japan, June 19, 1968, 43/42,362
Int. Cl. F26b *17/00*
U.S. Cl. 34—57 A **2 Claims**



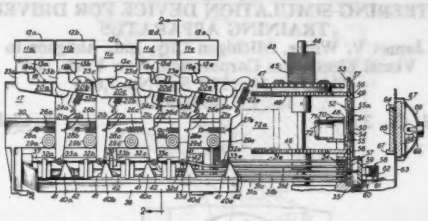
Apparatus for drying pulverant materials comprising a plurality of drying chambers arranged vertically in multiple stages, means for fluidizing and drying a moisture containing pulverant material with heat, while said pulverant material is continuously fed from the uppermost drying chamber as it passes through a fluidizing gas and heat exchanger means, means for advancing said materials through each successive drying chamber, while counterflowing hot gas against said materials, said material coming into contact with gas having progressively lower degrees of humidity in the lower chambers.

3,611,586
INSTRUCTIONAL TYPEWRITER
Shigeaki Kuramochi, Tokyo, Japan, assignor to Louis Marx & Co., Inc., New York, N.Y.
Filed Mar. 20, 1969, Ser. No. 808,918
Int. Cl. G09b *13/00*
U.S. Cl. 35—6 **6 Claims**



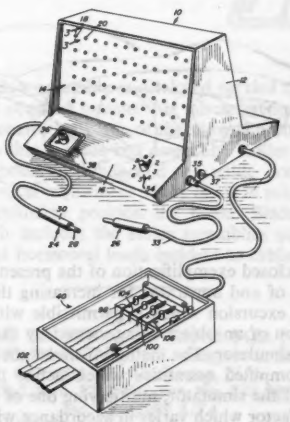
A typewriter capable of being used as an instructional device for correlating visual images with printed words by means of which a student can type the word identifying the visual image and thereafter compare the printed word associated with the visual image with the word the student has typed to verify the accuracy of the typed word.

3,611,587
RESPONSE MECHANISM FOR AUDIOVISUAL EDUCATIONAL APPARATUS
Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Apr. 7, 1970, Ser. No. 26,381
Int. Cl. G09b *3/00*
U.S. Cl. 35—8 A **1 Claim**



A manually actuable response mechanism for an audiovisual educational apparatus which permits an operator to respond selectively to audio and visual information presented by depressing one of a number of response keys, thereby initiating a further presentation of audio and visual information. The mechanism includes blocking means temporarily actuated by the operator's response to hold the apparatus in the condition established by the response for a period sufficient for the apparatus to react and to prevent additional responses from being effected during that period. Means are also provided for permitting the operator to respond to a presentation before that presentation has been completed whereby, upon completion of the presentation, the apparatus will proceed into a further presentation of audio and visual information without interruption.

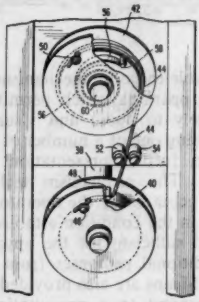
3,611,588
VISUAL-TACTUAL INTEGRATING DEVICE FOR TESTING AND TRAINING
Daniel N. Torretta, Tampa, Fla., assignor to Vikintactin Research Consultants, Inc.
Continuation-in-part of application Ser. No. 884,791, Dec. 15, 1969. This application June 24, 1970, Ser. No. 49,489
Int. Cl. G09b *5/00*
U.S. Cl. 35—9 **8 Claims**



Panel-mounted lamps are sequentially illuminated in accordance with a preselected pattern to be followed by

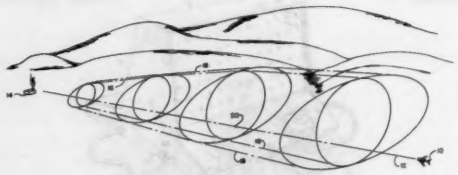
manipulation of photo-sensing pointers. An event registering device provides a record of light detection by the pointers and illumination of the lamps to enable analysis and scoring of a subject being trained or tested for motor response to visual stimuli.

3,611,589
STEERING SIMULATION DEVICE FOR DRIVER TRAINING APPARATUS
James V. Wiltse, Michigan City, Ind., assignor to Visual Electronics Corporation, New York, N.Y.
Filed Jan. 30, 1970, Ser. No. 7,003
Int. Cl. G09b *9/04*
U.S. Cl. 35—11 **9 Claims**



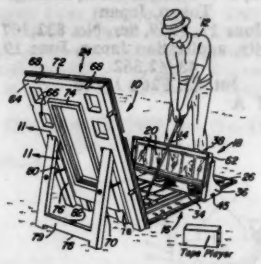
A steering simulation device for a driver-training apparatus, which includes steering assembly means, means connected thereto to provide a desired resistance to rotation of said steering assembly and to effect the return thereof to a fiducial position, and means to regulate such return.

3,611,590
VISUAL SYSTEM COMPUTER
Kenneth Levy, Binghamton, N.Y., assignor to Singer-General Precision, Inc., Binghamton, N.Y.
Filed Sept. 5, 1968, Ser. No. 757,733
Int. Cl. G09b *9/08*
U.S. Cl. 35—12 N **8 Claims**



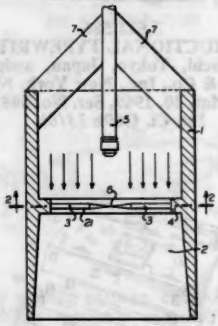
The disclosed exemplification of the present invention is a method of and apparatus for increasing the limits of a simulated excursion which is permissible with the optical information of an object being viewed by the operator of a vehicle simulator. The method includes the steps of generating computed quantities which define the simulated position of the simulator, multiplying one of those quantities by a factor which varies in accordance with a quantity corresponding to range from a particular point, and distorting the viewed image of the object in accordance with the resultant quantity.

3,611,591
GOLF TRAINING DEVICE
Victor T. Light, Sarasota, Fla., assignor to Professional Images Corporation
Filed Feb. 24, 1969, Ser. No. 801,735
Int. Cl. G09b *15/06*
U.S. Cl. 35—29 R **8 Claims**



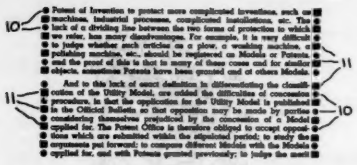
A frame-like housing encloses a mirror which is normally inclined upwardly. A display holder is positioned to reflect a photograph on the reflecting surface of the mirror. A mat connects the lower edge of the housing and includes indicia thereon for aiding a golfer in positioning himself and a club so that his image is similar to that reflected by the photograph.

3,611,592
APPARATUS FOR SCRUBBING GASES
Virgilio Stocchi, Mestre, Antonio Cavraro, Porto Marghera, Carlo Morsiani, Saronno, and Dario Vio, Porto Marghera, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy
Filed Nov. 4, 1969, Ser. No. 873,822
Claims priority, application Italy, Nov. 7, 1968, 23,393/68; Sept. 29, 1969, 22,639/69
Int. Cl. B01d *47/00*
U.S. Cl. 55—240 **11 Claims**



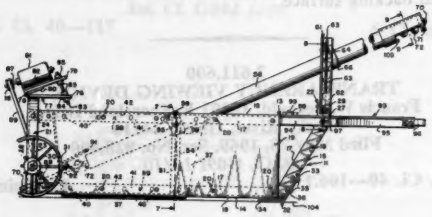
Scrubbing apparatus for separating vapors, liquid and solid particles from gas by a scrubbing liquid. A spout directs a full stream of the scrubbing liquid at a grid which comprises a multiplicity of spaced apart rods for forming films of the scrubbing liquid. The plane of the grid is transversely disposed with respect to the gas stream to be purified. The gas stream is passed through the films of scrubbing liquid for cleaning.

3,611,593
LINE-GROUP SEQUENTIAL READING AID
Harry S. Shapiro, 120 Ruth-Ellen Drive, Richmond Heights, Ohio 44143
Filed Nov. 14, 1969, Ser. No. 876,709
Int. Cl. G09b 17/02
U.S. Cl. 35—35 B 2 Claims



A system for aiding the eye of the reader in properly following the sequence of lines to be read by providing marginal indicia at the start of each line or line-group to guide the reader's eye to the start of the next succeeding line-group to be read and, preferably, to tie in this starting indicia with like indicia at the end of the preceding line-group.

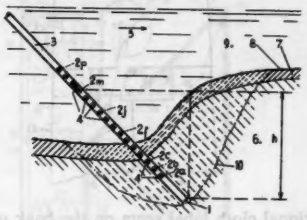
3,611,594
SCRAPER AND LOADER
Oddes O. Blackman, Rte. 1, Box 97, Zwolle, La. 71486
Filed Sept. 24, 1969, Ser. No. 860,567
Int. Cl. E02f 3/62
U.S. Cl. 37—1 8 Claims



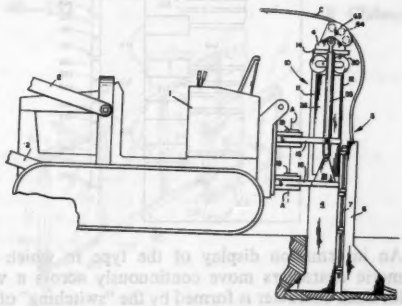
A machine drawn by a draft vehicle having a scraping blade disposed obliquely to its direction of travel, and a closed frame side functioning with a rear end of the scraping blade to confine the scrapings. A screw type conveyor has an inlet end operating in the confined space for conveying the scraping upwardly and forwardly for discharge into the body or hopper of the draft vehicle. Gauge means on the frame sides enables the scraping depth of the blade to be varied Adjustability of the draft tongue enables the machine to be supported solely by its engagement with the ground while in operation, and partially by the draft vehicle, when not in operation, for backing or for transporting the machine.

3,611,595
SUCTION DREDGER AND METHOD OF SUCTION DREDGING
Jan de Koning, Amsterdam, Netherlands, assignor to N.V. Ingenieursbureau voor Systemen en Octrooien Spanstaal, Rotterdam, Netherlands
Continuation-in-part of application Ser. No. 524,934, Feb. 3, 1966. This application Aug. 8, 1969, Ser. No. 866,050
Claims priority, application Netherlands, Feb. 4, 1965, 6501404
Int. Cl. E02f 3/92
U.S. Cl. 37—58 11 Claims

Method and apparatus for suction dredging particulate material such as sand. A suction pipe is inserted into a body of sand below the bottom of a body of water to withdraw a water-sand suspension having a desired concentration of sand in such suspension. At the lower end of the pipe, the sand is drawn in at very high concentration and at some level above this point water is separately introduced and the desired concentration is obtained by adjusting the level at which the water is introduced. The concentration of the resulting suspension is measured to enable the level of water introduction to be adjusted properly.



3,611,596
REAR MOUNTED CABLE PLOW ASSEMBLY
Kenneth G. Bright, Camas Valley, and Miles O. Standley, Pilot Rock, Oreg.; said Bright assignor to Henkels and McCoy, Inc., Blue Bell, Pa.
Filed Oct. 31, 1969, Ser. No. 872,853
Int. Cl. E02f 5/18
U.S. Cl. 37—193 3 Claims

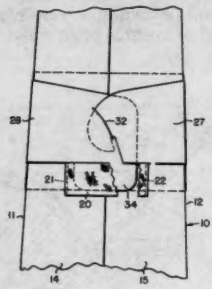


A cable plow assembly is disclosed carried by a tractor in a closely coupled manner for advantageous purposes. The earth penetrating blade of the plow is positionable up and down within a guide box assembly. Roller assemblies carried by both the blade and the guide box assembly facilitate vertical adjustment of the blade in said assembly. Hydraulic cylinders position the blade. Blade retention means which includes the roller assemblies supports the blade against horizontal loads incident to cable laying.

3,611,597
FOLD-OVER OR HOOK-ON BAND FOR NECKTIES
Donald E. Boyd, Chili, N.Y., assignor to Superba Cravats, Inc., Rochester, N.Y.
Filed Nov. 12, 1969, Ser. No. 875,981
Int. Cl. G09f 3/14
U.S. Cl. 40—21 R 2 Claims

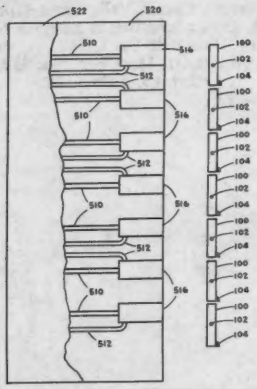
A paper or cardboard band, that is intended to be hooked around one end of a necktie while the necktie is hung on a display rack and that is adapted to bear the

trademark applied to the tie, and/or the maker's name, has a tab portion formed with a tongue that fits into the



conventional cloth label sewn on the back of the necktie, to prevent movement of the band on the tie.

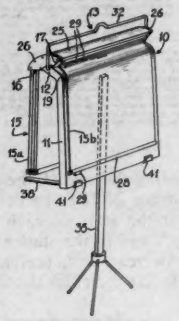
3,611,598
FLUIDIC SWITCHING APPARATUS
Robert F. O'Keefe, Trumbull, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Filed Oct. 13, 1969, Ser. No. 865,941
Int. Cl. G09f *11/00*
U.S. Cl. 40—28 C **22 Claims**



An information display of the type in which alphanumeric characters move continuously across a viewing field. Each character is formed by the "switching" of an appropriate group of elements in a rectangular character matrix. The elements are rotatable discs, which are switched by flipping them over. The element selection logic, and the switching energy as well, is achieved through fluidic means. Each disc element is confronted with a power jet, and a control jet capable of changing the character of the power jet from laminar to turbulent. The discs experience a switching torque when impulsed by a laminar power jet, but the turbulent condition of the power jet distributes its impact in such a manner that there is no longer sufficient net torque to flip the disc. Thus, by proper selection of the control jets, an appropriate pattern of elements can be switched on.

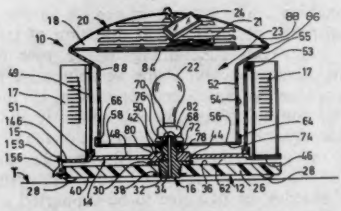
3,611,599
VISUAL AID DEVICE
Dieter Baars, 13 Raven St., Nashua, N.H. 03060
Filed Aug. 15, 1969, Ser. No. 850,464
Int. Cl. G09f *9/46*
U.S. Cl. 40—65 **15 Claims**

An improved visual aid device of the "flip chart" type employing a plurality of concentrically disposed flat channeled guides supporting display sheets in a manner to be slid from a rearward stored position to a forward use position in engagement with an inclined backing surface. The edges of the channeled guides provide means for stocking and aligning the same, and are secured together by clamp means at the ends thereof. Forward and rear



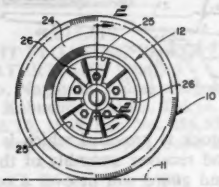
edges of the display sheets are provided with stiffening stop members, with the forward stop members suitably including indexing tabs, and the rear stop members being sufficiently weighted to pull the sheets through the channeled guides when the front edges are lifted from the inclined backing surface.

3,611,600
TRANSPARENCY VIEWING DEVICE
Francis W. Seebald, 18801 E. Shoreland Drive, Rocky River, Ohio 44116
Filed May 28, 1969, Ser. No. 828,490
Int. Cl. G09f *13/10*
U.S. Cl. 40—106.1 **15 Claims**



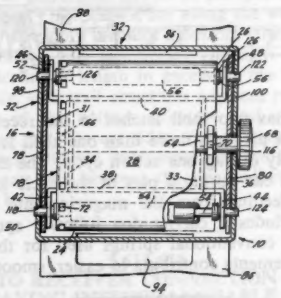
A device for viewing transparent photographic slides including a base adapted to be mounted on a table or the like. A transparent slide support rack is mounted on the base for supporting a plurality of slide members thereon, and is disposed in overlying relation with respect to a light source to illuminate the respective slides. A turret-like slide storage tray is mounted for rotation on the base enabling storage of a large number of slides on the device itself. A plurality of slide storage cartridges are supported adjacent the periphery of the tray to enable the same to be moved to a readily accessible position for selection of a respective slide or group of slides. The slide support rack includes a plurality of slide receiving receptacles arranged to enable the placement of a large number of slides on the support rack at one time and for facile stacking of the slides for storage in the slide storage cartridges after use.

3,611,601
ROTATING WHEEL TIRE DISPLAY
George P. Stropkay, Mentor, and Edward J. Stropkay, Chesterland, Ohio, assignors to Product Design and Manufacturing Corp., Willoughby, Ohio
Filed Feb. 17, 1970, Ser. No. 12,064
Int. Cl. G09f 19/02
U.S. Cl. 40—106.51 7 Claims



A display assembly for mounting within a tire, the assembly including a simulated wheel part and an electric motor for rotating the same independently of the tire. A lamp can be added behind the wheel part and openings provided in the latter for interior illumination of the display.

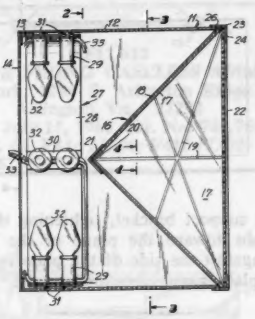
3,611,602
CALENDAR MECHANISM ATTACHMENT FOR A WATCH BRACELET OR THE LIKE
Morris D. Gandelman, Fort Lee, and Salvatore Bello, Cliffside Park, N.J., assignors to Jacoby-Bender, Inc., Woodside, N.Y.
Filed May 20, 1969, Ser. No. 826,156
Int. Cl. G09d 3/06
U.S. Cl. 40—117 6 Claims



An elongated resilient member having a plurality of indicia-carrying regions sequentially provided on one surface thereof is incrementally movable past a viewing station. That resilient member has the characteristic that at any position thereof the net force acting on that member in the direction of its movement is effectively zero so that the member will stay at any position to which it is moved. The indicia provided on that surface of the resilient member may be the twelve monthly calendars of a year, one monthly calendar being viewable at the viewing station at a given time.

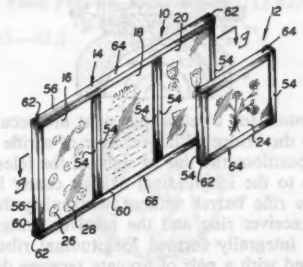
3,611,603
ILLUMINATED DISPLAY DEVICE
Herbert Gesner III, 789 W. End Ave., New York, N.Y. 10025
Filed June 2, 1969, Ser. No. 829,432
Int. Cl. G09f 13/14
U.S. Cl. 40—130 B 8 Claims

An illuminated display device includes a housing of square transverse cross-section and is closed by a light transmitting panel at its front end. Triangular reflector plates have forwardly reflecting faces and extend rearwardly from the housing leading edges and delineate a hollow forwardly open pyramid with an apex proximate the housing rear wall. The reflector plates have a plural-



ity of elongated transparent areas, and intermittently or continuously energized lamps of different colors direct light through the transparent areas onto the plates which reflect the light onto the front panel, as well as directly onto the front panel.

3,611,604
FRAMED DISPLAY
Harriett Saltzman, % Aracon Electronics, Inc., 1437 2nd Ave., New York, N.Y. 10021
Filed Oct. 21, 1969, Ser. No. 868,048
Int. Cl. G09f 1/12
U.S. Cl. 40—152 8 Claims

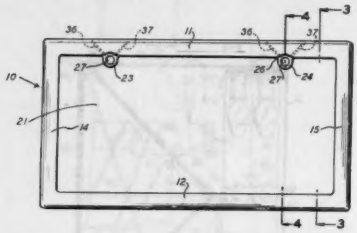


A framed product display in which the product being displayed is mounted on a yielding or resilient body which is confined between a transparent front panel and a rigid rear panel within a frame formed of channel-type bordering frame members, the urgency of the yielding or resilient body being effective to both press the product against the transparent front panel and also hold the individual parts of the assembly in place within the bordering frame members.

3,611,605
LICENSE PLATE FRAME
Jeffrey N. Baker, 26 Laguna Place, Long Beach, Calif. 90803
Filed Apr. 23, 1970, Ser. No. 31,217
Int. Cl. G09f 7/00
U.S. Cl. 40—209 6 Claims

A rectangular frame with transversely concave sides has two spaced tabs extending from a long side toward the frame center. Both tabs diverge from the plane of the frame from 5 to 30 degrees, depending on the frame

material. Each tab has a fastener hole extending through the tab at an angle commensurate with tab divergence. When the frame is fastened to a license plate by fasteners passing through the frame tabs, the plate and a conventional plate support bracket, tightening the fastener distorts the tabs toward the plane of the frame, loading the frame against the side of the plate opposite the tabs to dampen plate-frame vibration contact.

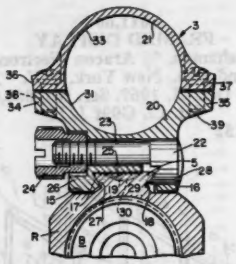


3,611,606

TELESCOPIC SIGHT MOUNT FOR RIFLES

Harry H. Sefried, New Haven, Conn., and Leroy J. Sullivan, Huntington Beach, Calif., assignors to Sturm Ruger & Co., Inc., Southport, Conn.

Filed May 7, 1969, Ser. No. 822,630
Int. Cl. F41g *1/38*
U.S. Cl. 42—1 S **4 Claims**



Sight mounts for a telescopic sight are secured to the ring and to the bridge of the receiver of a rifle in a manner which positions the line of sight of the telescope relatively close to the longitudinal axis or center line of the bore of the rifle barrel without weakening the receiver ring. The receiver ring and the receiver bridge are provided with integrally formed longitudinal ribs, each rib being formed with a pair of arcuate recesses disposed on opposite sides of each rib. Each arcuate recess has an inwardly inclined bearing surface adapted to engage a matching arcuate beveled locking element of the sight mount. Because of the arcuate configuration of the mount-receiving recess, it is possible to locate the recesses closer to the longitudinal center line of the rifle barrel without reducing the strength of the barrel in the critical area of the cartridge chamber. Longitudinal movement of the sight mount relative to the receiver is prevented by a depending lug which enters a transverse slot formed in the upper surface of the receiver rib.

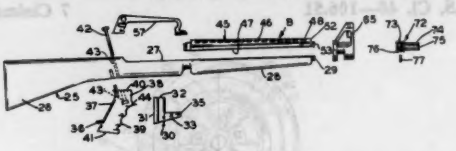
3,611,607

FIREARM CONVERSION SYSTEM

Thomas Donnell, 17 Godier Drive, East St. Louis, Ill. 62203

Filed Aug. 6, 1969, Ser. No. 847,890
Int. Cl. F41c *21/00, 23/00*
U.S. Cl. 42—1 **19 Claims**

A firearm conversion system for modifying the military type M–1 30 cal. carbine in such manner that it has an overall asthetic appearance similar to the military M–16 rifle or the civilian version of such rifle, namely the AR–15 rifle. The system which may include components packaged in the form of a kit for the firearm enthusiast to make the conversion on his own, generally uses the barrel and receiver assembly of the M–1 carbine in combination with the components provided by the present invention. A stock is provided which is adapted to receive the barrel and receiver assembly of the M–1 carbine and an upper hand guard will fit over a portion of the barrel and mate with a portion of the stock. An upper hand grip, front sight and similar accessories are provided so that in the assembled condition the carbine will have an overall appearance which resembles the M–16 rifle.

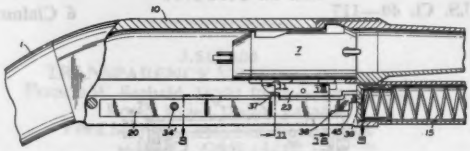


3,611,608

GUN HAVING TWO SHELL LATCHES WITH A PLURALITY OF CAM FOLLOWERS

Theophilus K. Seiberling, 39 Maplewood Ave., Akron, Ohio 44313

Continuation-in-part of abandoned application Ser. No. 736,101, June 11, 1968. This application Dec. 24, 1968, Ser. No. 788,991
Int. Cl. F41c *11/00, 15/00*
U.S. Cl. 42—17 R **27 Claims**



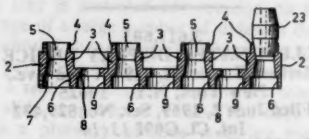
The gun has two shell latches in the receiver cavity, one of which prevents more than one shell from feeding into the cavity during one action cycle. The other is held by an action bar during a part of the cycle to prevent a shell from feeding from the magazine into the cavity. The gun includes a carrier dog follower spring that is weaker than conventional springs used for this purpose. Both improvements contribute to easier, smoother action.

3,611,609

TOY CONSTRUCTION ELEMENTS CONNECTIBLE BY PROJECTIONS IN RECESSES

Johannes Martinus Reijnhard, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

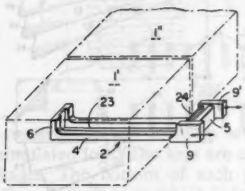
Filed Jan. 2, 1969, Ser. No. 788,465
Claims priority, application Netherlands, Jan. 3, 1968, 6800094
Int. Cl. A63h *33/08, 33/10*
U.S. Cl. 46—25 **8 Claims**



A toy construction element having a row of projections on the top side and corresponding recesses on the bottom side, and a bore through each projection and coaxial

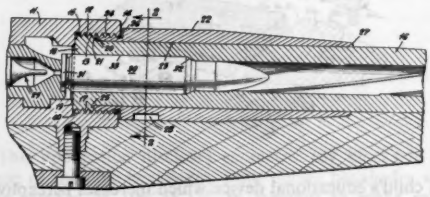
recess; each bore defines a pair of truncated cones joined at their mutual and smaller diameter. Between each pair of adjacent projections is an auxiliary aperture having its opening on the bottom side formed as one of said recesses. Two of said elements are joinable either by insertion of a projection of one into a recess of another, or by placing a connection element having two conical ends in bores of two adjacent structural elements.

3,611,610
WATERTIGHT FLOATING BOXES USING WATERTIGHT DOORS
Toshiya Yamamoto, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sept. 10, 1969, Ser. No. 856,558
Claims priority, application Japan, Sept. 25, 1968, 43/69,280
Int. Cl. B63b *3/04, 9/00*
U.S. Cl. 114—77 **8 Claims**



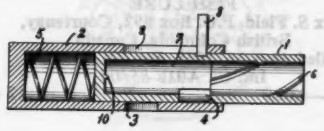
A watertight floating box, for use in working on submerged surfaces of floating bodies, such as ship hulls, comprises a caisson assembly arranged to enclose, in watertight fashion, the submerged surfaces upon which work is to be performed and to be pumped free of water to provide a dry working space along the work surfaces. The caisson assembly includes a bottom structure extending horizontally and transversely beneath the floating body and having a length in excess of the beam of the floating body, side wall structures adjacent respective opposite ends of the bottom structure and extending upwardly along the adjacent sides of the floating body, and door members slidable transversely of the floating body to seal off any gaps between the side wall structures and the floating body.

3,611,611
BARREL TO RECEIVER CONNECTION FOR FIREARMS HAVING INTERCHANGEABLE BARRELS
James L. Quinney, Jackson, Wyo., assignor to Idaho Bank of Commerce, Rexburg, Idaho
Filed Dec. 15, 1969, Ser. No. 885,382
Int. Cl. F41c *21/00*
U.S. Cl. 42—75 B **5 Claims**



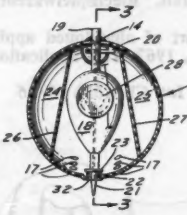
A firearm having interchangeable barrels wherein each barrel is attached to the receiver portion of the firearm and is prevented from relative rotation with respect thereto by a locking sleeve which fits over the barrel. The barrel is screwed into a threaded bore in the receiver of the firearm until its end face abuts a seating surface therein. The sleeve is then fitted over the barrel and screwed into the same bore in the receiver as the barrel until its end abuts the threaded portion of the barrel. Any tendency of the barrel to rotate out of the receiver is effectively prevented by the locking action of the sleeve.

3,611,612
FIREARM FOR FIRING CASELESS AMMUNITION
Michael W. York, 1200 S. Arlington Ridge Road 507, Arlington, Va. 22202
Filed July 15, 1968, Ser. No. 744,765
Int. Cl. F41c *21/00;* **F41f** *17/02*
U.S. Cl. 42—76 **10 Claims**



A firearm for firing caseless ammunition is presented in which the caseless or combustible cased cartridge is not introduced into the barrel at its breech end, but is introduced into either the muzzle of the barrel or at some point along the barrel where the pressures exerted upon the barrel when the cartridge is fired will be lower than those exerted upon the breech portion of the barrel.

3,611,613
CASTING FLOAT FOR LIVE BAIT
Robert Perches, 2147 W. 162nd St., Gardena, Calif. 90247
Filed Feb. 20, 1970, Ser. No. 13,037
Int. Cl. A01k *97/04*
U.S. Cl. 43—41.2 **10 Claims**

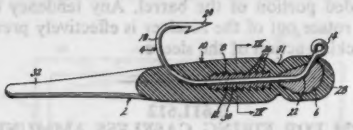


A casting float which releasably encloses and protects live bait during casting. The casting float comprises a pair of float halves having air compartments arranged to cause the float to move automatically to an upright position as soon as it enters the water. A movable float disposed within the casting float is automatically moved upwardly by water buoyancy to automatically open the casting float and permit the live bait, hook and sinker to fall into the water.

3,611,614
FISHING LURE
Virgil V. Ward, Box 118, Amsterdam, Mo. 64723
Filed Sept. 24, 1969, Ser. No. 860,618
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.24 **3 Claims**

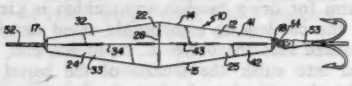
A fishing lure consisting of an insect-like body member of very soft plastic having the shank portion of a fishhook molded longitudinally therein, the point and eye portions of said hook being laterally offset in the same

direction from said shank to project outwardly from said plastic body, and one or more enlargements affixed to said shank and molded in said plastic body, said enlargements



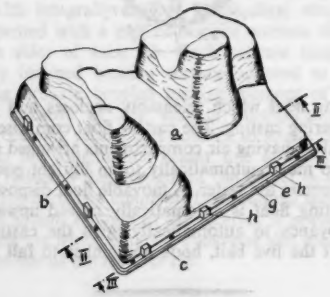
serving both as weights to hold the hook in a desired position in use, and to hold the plastic body in secure engagement with the hook.

3,611,615
FISH LURE
Rex S. Field, P.O. Box 892, Courtenay, British Columbia, Canada
Filed Aug. 26, 1968, Ser. No. 755,129
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.36 **12 Claims**



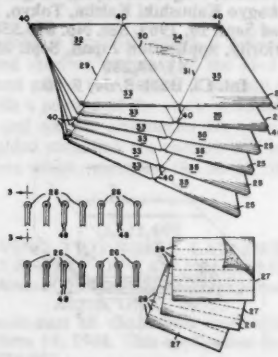
A fish lure having a slender elongated body which will sink in water and which is larger in thickness and width at its longitudinal center than at its ends. The body tapers symmetrically from the longitudinal center toward the ends and is substantially diamond-shaped in cross section at any transverse plane thereof.

3,611,616
TOY PLAYING BOARD
Alfred Einfalt, Nuremberg, Germany, assignor to Gebruder Einfalt, Blechspielwarenfabrik, Nuremberg, Germany
Continuation-in-part of abandoned application Ser. No. 614,190, Feb. 6, 1967. This application Jan. 27, 1970, Ser. No. 6,121
Int. Cl. A63h *19/36*
U.S. Cl. 46—1 R **5 Claims**



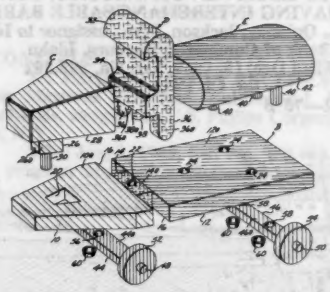
A toy playing board simulating a mountainous landscape has at its edge a peripheral flange. This flange includes along its length an upwardly protruding rib reinforcing the flange and a downwardly extending protrusion constituting a first supporting surface for placing the board on a flat base such as a table. The rib is outwardly continued by a lateral flat flange portion constituting a second supporting surface coplanar with the first supporting surface. The flange further includes lengthwise spaced apart upwardly extending protrusions which constitute support surfaces for a second playing board to be nested with the first playing board.

3,611,617
NOVELTY TOY
William A. Foster and Edward W. James both % Foster Industries, Inc., P.O. Box 3545, Baltimore, Md. 21214
Filed Sept. 20, 1968, Ser. No. 761,136
Int. Cl. A63h *33/00*
U.S. Cl. 46—1 L **4 Claims**



An improved novelty toy is provided by hinging together in a circle a group of pyramidal blocks. The blocks are formed first as separate elements and various means may be employed for connecting them together in series at mutually adjacent edges such as elongated U-shaped pins, adhesive tape, etc., thereby permitting the device as a whole to be twisted about a circular axis to expose different groups of faces of the blocks to the view of a person manipulating the device.

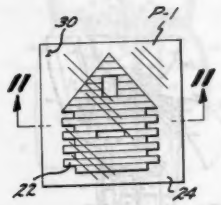
3,611,618
CHILD'S EDUCATIONAL DEVICE
Arthur F. Steiner, 4117 Greenbrier Road, Long Beach, Calif. 90808
Filed Aug. 22, 1969, Ser. No. 852,274
Int. Cl. A63h *33/06*
U.S. Cl. 46—17 **5 Claims**



A child's educational device which increases perceptiveness as to color and form and includes a member having an external surface that is subdivided into a number of different color and a number of objects, with the surface of each of said objects being complementary in shape and color to one of said areas. The objects and member include means for removably holding them together when

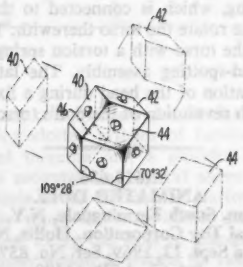
the surfaces of the objects are in abutting contact or adjacently disposed, and when the objects are so positioned relative to the member, they are in a predetermined pattern and cooperate with the member to define a replica of a piece of equipment with which a child is familiar.

3,611,619
TOY INCLUDING PLURAL PACKAGES WITH IMPRINTED PATTERNS AIDING CONSTRUCTION
William B. Testa, 16742 Baruna Lane, Huntington Beach, Calif. 92647
Filed July 6, 1970, Ser. No. 52,565
Int. Cl. A63h *33/08*
U.S. Cl. 46—20 **4 Claims**



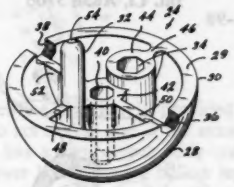
A building construction toy includes several packages of cut-to-size simulated logs. The logs are arranged loosely in the packages. The bottom of each package is defined by a cardboard sheet upon which is imprinted a pattern which the logs in the package should collectively assume to define a wall or roof portion of a completed miniature building. When the package is opened the logs are glued together over the pattern in the proper configuration. The walls and roof members are then interconnected so as to construct a completed building. The building may be knocked-down after construction for subsequent reassembly.

3,611,620
RHOMBIC HEXAHEDRA BLOCKS FOR MAKING RHOMBIC DODECAHEDRA AND RHOMBIC TRIACONTAHEDRA
Charles O. Perry, 14 Via Ippolito Pindemonte, 00152 Rome, Italy
Filed June 2, 1969, Ser. No. 829,691
Int. Cl. A63h *33/08*
U.S. Cl. 46—25 **12 Claims**



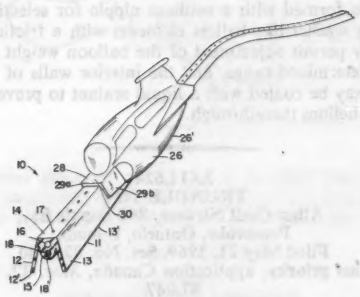
This application discloses geometric toy blocks in the shape of rhombic hexahedra. Four obtuse hexahedra with face vertices of 109°28′17″ fit together to make many geometric shapes including the rhombic dodecahedron. Ten acute hexahedra and ten obtuse hexahedra with face vertices of 116°33′54″ fit together to make many geometric shapes including the rhombic triacontahedron. The hexahedron blocks have attaching means, preferably as shown in Pat. No. 3,413,752, for attaching the blocks together in face to face relation; in this situation the blocks are made with two groups of three faces each integrally formed and joined at their common vertex to the stems of the latches which extend through the three faces of the other group.

3,611,621
BUILDING UNIT TOY
Henry J. Folson, Redondo Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed May 15, 1969, Ser. No. 824,795
Int. Cl. A63h *33/08*
U.S. Cl. 46—25 **2 Claims**



A toy building unit of spherical shape with four holes spaced around its outer surface for receiving pins to join it to other building units. Each spherical building unit is formed of two identical molded elements, each element forming a hemisphere with a stud extending toward the other element and a hole for receiving the stud of the other element.

3,611,622
TRACK TOY
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Filed Feb. 16, 1970, Ser. No. 11,562
Int. Cl. A63h *29/16*
U.S. Cl. 46—44 **10 Claims**

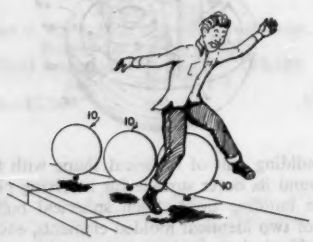


A toy vehicle and trackway therefore are provided in which compressed air is utilized as a medium for propulsion of the toy along the trackway. In one form, the trackway is an elongated extrusion, such as a rectangular, hollow tube, containing holes drilled through a wall thereof substantially along the length of the tube and directed so as to permit air pumped into the tube to be ejected as a plurality of jet streams upwardly and in the direction of movement of the vehicle. The vehicle is a lightweight shell having one or more portions conforming to the configuration of the track or trackway and adapted to normally rest with one or more undersurfaces of the vehicle abutting or disposed immediately off the surface of the track. Air pumped into the track is directed through the holes in the wall thereof upwardly against the conforming surface of the vehicle and is operative to both lift the vehicle and cause it to travel along the track. The track may be made of flexible or rigid material. If flexible, it may contain a

bendable metal wire so that it may be bent and retained in a particular curved configuration.

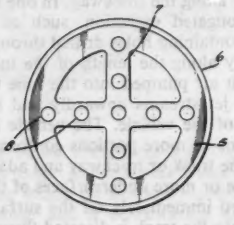
In another form, the track is in the shape of a hollow monorail supported at spaced intervals above a surface by means of poles and the vehicle is suspended from a carriage which is driven along the monorail by air ejected upwardly through holes in the upper wall of the monorail.

3,611,623
TOY BALLOON AMUSEMENT DEVICE
Terrance R. Copstead, Charlotte, N.C., assignor to Electronic Data Controls Corporation, Forsyth County, N.C.
Filed Feb. 26, 1970, Ser. No. 14,413
Int. Cl. A63h *3/06*
U.S. Cl. 46—90 **8 Claims**



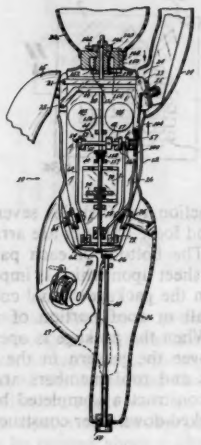
An amusement device which includes an inflatable toy balloon, and an aerosol-type container charged with a supply of helium under pressure. The container includes a discharge valve fitted with an adapter for receiving the neck portion of the balloon to permit inflation of the balloon, and the container is charged with a supply of helium that is measured to substantially counterbalance the weight of the balloon so that when the entire contents of the container is discharged into the balloon, the balloon will be in a state of gravitational equilibrium. The balloon may be formed with a resilient nipple for selectively receiving washer-like ballast elements with a friction fit to thereby permit adjustment of the balloon weight through a predetermined range, and the interior walls of the balloon may be coated with a liquid sealant to prevent leakage of helium therethrough.

3,611,624
TRUNDLE TOY
Allan Cecil Nieman, 268 Supple St., Pembroke, Ontario, Canada
Filed May 21, 1969, Ser. No. 826,380
Claims priority, application Canada, Mar. 27, 1969, 47,047
Int. Cl. A63h *5/00, 33/02*
U.S. Cl. 46—114 **1 Claim**



A toy play device in the form of a spoked wheel having apertures formed in the spokes and bells pressed into the apertures to provide a musical sound as the wheel is propelled along the ground by a stick having a flattened portion to start the wheel rolling down the stick and a cross-member at its lower end to guide the wheel.

3,611,625
DOLL WITH ROTATABLE BODY AND APPENDAGE ROTATABLE IN DELAYED RELATION THERETO
Conrad B. Sloop, Huntington Beach, Denis V. Bosley, Palos Verdes Peninsula, Elliot Handler, Los Angeles, Joseph Kossoff, Hawthorne, James F. Munday, South Gate, and John W. Ryan, Los Angeles, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Sept. 11, 1968, Ser. No. 758,934
Int. Cl. A63h *11/00*
U.S. Cl. 46—120 **11 Claims**

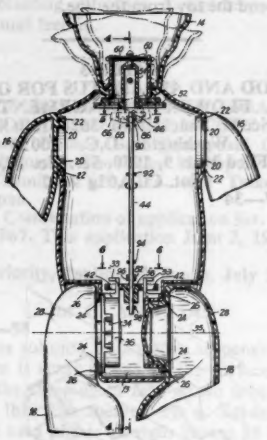


An animated doll energizable by a reversible DC motor selectively animating a stepping motion or a rotational motion with head-spotting. The doll includes a rotatable shaft which is movable along its axis of rotation from a neutral position to an upward position in which the shaft engages a crankshaft assembly to cause the doll's legs to move with respect to the doll's torso to produce a stepping motion. The rotatable shaft is also movable to a downward position in which the shaft drivingly engages a floor-contacting member which is inhibited from rotating thereby causing the drive train and the motor's housing, which is connected to the doll's torso, to rotate and to rotate the torso therewith. The doll's head is coupled to the torso with a torsion spring, which forms part of a head-spotting assembly. The latter is used to inhibit the rotation of the head during a fixed preselected portion of each revolution of the doll's torso.

3,611,626
ANIMATED DOLL
Ralph Bornn, South Farmingdale, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.
Filed Sept. 12, 1969, Ser. No. 857,346
Int. Cl. A63h *11/00*
U.S. Cl. 46—120 **4 Claims**

An animated doll is described as including a doll's body, a head movably mounted on the body for side-to-side nodding motion and legs mounted on the body for hand-assisted walking motion. The legs are operatively connected to a neck mechanism including a collar element, which provides the nodding motion for the head. The walking motion is translated, by means of a main shaft and a horizontally-disposed plate, both rotating in an

oscillatory manner about a vertical axis, to rotary rocking motion of the collar element in the vertical plane



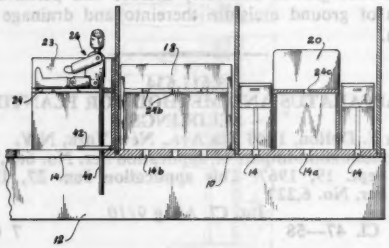
about a horizontal axis to thereby provide the nodding motion for the head.

3,611,627

ACTIVITY TOY WITH ARTICULATED MOVABLE HUMAN FIGURES

Donald Forman, Freehold Township, Monmouth County, N.J. (32 Double Creek Parkway, Freehold, N.J. 07728)

Filed July 9, 1970, Ser. No. 53,448
Int. Cl. A63h *7/00*
U.S. Cl. 46—126 **5 Claims**



An activity toy comprising a slotted elevated horizontal platform having slotted articles of furniture and appliances mounted thereon and a plurality of articulated human figures mounted on vertical stems which extend through the slots in the horizontal platform, said stems being manually supported from below the platform and manually moved along the slots to transport the articulated figures from station to station on said platform and into and out of engagement with the slotted articles of furniture and appliances. The slots in the elevated platform are labyrinthine, interconnected and intercommunicating for movement of the figure-supporting stems from slot to slot and from position to position along each slot. The figure-supporting stems are also vertically movable through the slots, and they are provided with horizontal plates which serve as stands for mechanically supporting the figures in upright position on the platform.

3,611,628

TOY PUPPET-LIKE FIGURINE

Sid Noble, West Orange, N.J., and George Gilder, Forest Hills, N.Y., assignors to Remco Industries, Inc., Harrison, N.J.

Filed Sept. 19, 1969, Ser. No. 859,269
Int. Cl. A63h *3/14*
U.S. Cl. 46—154 **1 Claim**

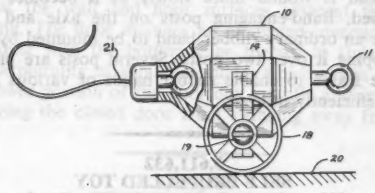
A toy puppet-like figurine is provided to permit a child's fingers to act as legs and at the same time support the figurine. It has a rigid upper body connected to an elastic fabric lower body forming hollow legs. The elastic lower body has a recess formed in the rear to receive two fingers within the legs to simulate a walking motion. An elastic loop secured to the upper body presses the fingers against the back of the upper body so they can support the upper body.

3,611,629

ATTACHABLE WHEELS FOR PLASTIC BLOCKS

Charles F. Foley, 3908 Merriam Road, Minnetonka, Minn. 55343, and Charles D. McCarthy, Rte. 3, Box 217BA, Deephaven, Minn. 55391

Filed Jan. 28, 1970, Ser. No. 6,437
Int. Cl. A63h *11/10*
U.S. Cl. 46—201 **8 Claims**



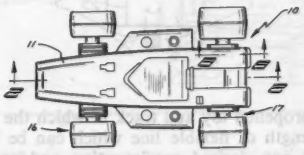
A wheel assembly which can be snapped onto plastic blocks, commonly known as "pop beads" or "pop blocks" to make trains or vehicles out of a string of the blocks.

3,611,630

WHEELED TOY VEHICLE

Cecil F. Adickes, Playa Del Rey, Calif., and Gary D. Bies, Plymouth, Minn., assignors to Tonka Corporation, Mound, Minn.

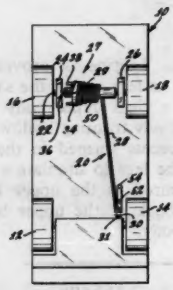
Filed May 4, 1970, Ser. No. 34,413
Int. Cl. A63h *17/26*
U.S. Cl. 46—201 **9 Claims**



A wheeled toy vehicle in which each wheel and axle assembly is integrally mounted with the axle of tempered resilient spring steel wire having its ends embedded in

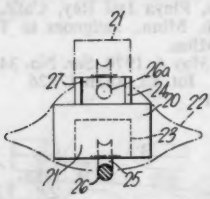
inwardly extending hub members. The axle rides in a low friction central upper bearing for fast wheel rolling while the said wheel hub members are loosely trapped by body portions of the vehicle to prohibit strain on the axle when diametrical or axial pressures are applied to said members. The hub members carry tires having an outer diameter at least twenty times greater than that of the axle.

3,611,631
RUBBER BAND POWERED TOY VEHICLE
Henry J. Folson, Redondo Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Dec. 5, 1969, Ser. No. 882,553
Int. Cl. A63h *17/00*
U.S. Cl. 46—206 **2 Claims**



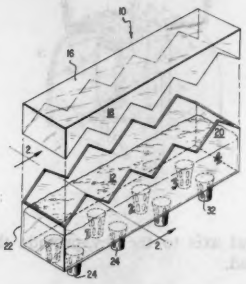
A rubber band motor for a toy truck or other toy vehicle, which efficiently utilizes an ordinary rubber band. The motor includes a tapered receiving portion fixed to one vehicle axle, and the rubber band is positioned to wind onto the axle around the tapered portion so that the band is wound more slowly as it becomes highly stretched. Band-engaging posts on the axle and frame enable an ordinary rubber band to be mounted by merely slipping it over two posts. Several posts are provided on the frame to enable rubber bands of various lengths to be efficiently utilized.

3,611,632
SELF PROPELLED TOY
Sidney David Smith, 88 Romsey Road, Winchester, Hampshire, England
Filed Oct. 8, 1969, Ser. No. 864,706
Claims priority, application Great Britain, Oct. 9, 1968, 47,884/68; Nov. 20, 1968, 55,105/68
Int. Cl. A63h *33/26*
U.S. Cl. 46—243 **13 Claims**



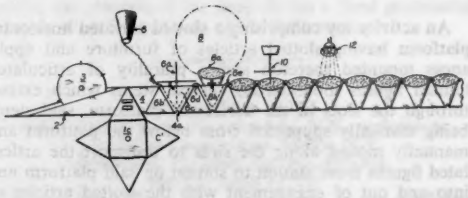
A self propelled toy and track in which the track comprises a length of flexible line which can be layed on a surface in any desired configuration and/or suspended above said surface and the toy comprises a basic body unit and a motor containing unit having a guide wheel which engages with the track, the motor containing unit being able to be attached to the body unit in two alternative positions so that in one position the guide wheel is located on the lower part of the body unit and in the other position is located on the upper part of the body unit to suspend the toy from the line.

3,611,633
METHOD AND APPARATUS FOR OUTDOOR FLOWER ARRANGEMENTS
Clarice W. Shackelford, 3628 13th St. NW., Washington, D.C. 20010
Filed Mar. 9, 1970, Ser. No. 17,477
Int. Cl. A01g *9/02*
U.S. Cl. 47—34 **9 Claims**



A plant receptacle which, individually, combines the functions of a miniature hothouse, a planter and a transplanting container; and, in conjunction with other like receptacles, may be used to define desired plant growth patterns such as in the case of flower arrangements for parks, yards and the like. A transparent receptacle and closure define, in effect, a miniature hothouse which is provided with a plurality of perforated tubular members depending therefrom for the combined purposes of anchoring the receptacle in a desired location, permitting plant root growth exteriorly thereof and permitting ingress of ground moisture thereinto and drainage therefrom.

3,611,634
APPARATUS AND METHOD FOR PLANTING SEEDLINGS
John E. Dalton, 1140 5th Ave., New York, N.Y. 10028
Continuation-in-part of application Ser. No. 668,761, Sept. 19, 1967. This application Jan. 27, 1970, Ser. No. 6,222
Int. Cl. A01g *9/10*
U.S. Cl. 47—58 **7 Claims**



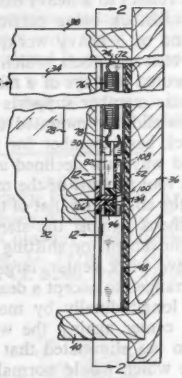
The strip of material is folded lengthwise and formed into a series of pockets which are connected together by intervening web portions. These pockets are of V-shaped contour and are adapted to receive charges of fertilized earth and seeds. In addition, a cord is looped into each of the pockets so as to permit intermeshing with the root

system into the earth ball formed with the roots of the seedlings. Pulling up on the root embedded cord allows the earth ball to be moved up out of the pocket for subsequent transplanting purposes, completely mechanically with nonmanual feed-in.

3,611,635
METHOD OF OBTAINING LEAF TOBACCO WITH LOW CONTENT OF NICOTINE
Masao Tanaka, Hatano, and Tomoyoshi Ono, Akashi, Japan, assignors to The Japan Monopoly Corporation, Nikken Chemicals Co., Ltd. and Taiko Co., Ltd., Tokyo, Japan
No Drawing. Continuation of application Ser. No. 654,082, July 18, 1967. This application June 3, 1970, Ser. No. 41,756
Claims priority, application Japan, July 20, 1966, 41/47,052
Int. Cl. A24b *15/02*
U.S. Cl. 47—58 1 Claim

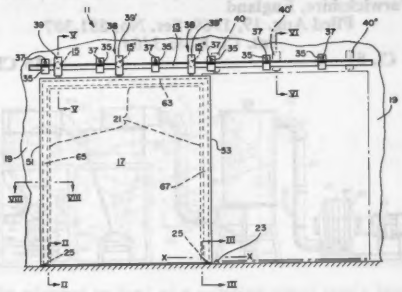
An aqueous solution or aqueous suspension of a film-forming agent is spray-spread on the surfaces of tobacco leaves after the stopping of field-grown tobacco, to form an insoluble thin film thereon. As a film-forming agent there may be used higher alcohols having 16 to 22 carbon atoms in the molecule and their derivatives; animal, vegetable and mineral waxes; high polymers or substances which are generally as a vehicle.

3,611,636
HEAVY-DUTY SELF-LOCKING SASH BALANCE
Donald M. Trout, 15750 Meyers Road, Detroit, Mich. 48227
Filed Sept. 24, 1969, Ser. No. 860,707
Int. Cl. E05d *15/22*
U.S. Cl. 49—181 5 Claims



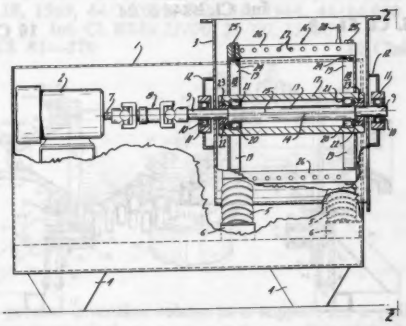
An elongated sash guide adapted to be mounted on at least one side of a window frame has a longitudinally-slotted spring casing to one end of which is secured one end of a sash balancing spring. Connected to the other end of the spring is a slide block provided with a transverse bore and a pair of pivot bosses adjacent thereto. Pivotally mounted on one of the pivot bosses is a sharp-ended locking lever having a cam follower arm on the opposite end thereof. Rotatably mounted in the slide block bore is a rotary lock-operating cam operatively engageable with the cam follower portion for tilting the lever relatively to the cam and thereby moving its sharp edge into positive locking engagement with the casing. The lock-operating cam contains a notch of non-circular cross-section operatively engageable with a trunnion key of similar cross-section secured to the window sash and rotating the cam in response to the swinging of the window sash relatively to the window frame opening around the trunnion key as a fulcrum. The slide block and the locking lever are adapted to be interchangeably mounted on opposite sides of the window frame by reversing the position of the locking lever from one pivot boss to the other, but using cams with oppositely-facing recesses in the slide block bore.

3,611,637
SLIDING DOOR ASSEMBLY
Joseph N. Saino, 3554 Oakley Ave., Memphis, Tenn. 38111
Filed Mar. 4, 1970, Ser. No. 16,467
Int. Cl. E05d *13/06*
U.S. Cl. 49—235 6 Claims



A track suspended sliding door assembly comprising an overhead track having a plurality of recesses along one member thereof for slidably receiving a like number of beveled wheels as the door moves inwardly and downwardly so as to seal the marginally adhered door gasket against the wall and floor surfaces adjacent the door opening. The door includes an elongated inverted V co-extending with the bottom edge thereof to slidably engage a plurality of subjacent guides which aid in moving the lower portion of the door downwardly and inwardly, obviating the closed door from swinging away from the wall.

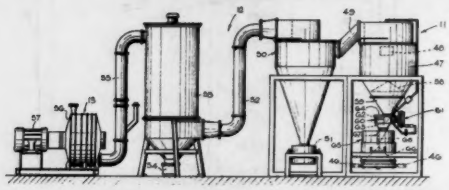
3,611,638
FINISHING MACHINE
John K. Deede, Milwaukee, Wis., assignor to Electro-Deburring Co., Inc., Milwaukee, Wis.
Filed Apr. 1, 1970, Ser. No. 24,737
Int. Cl. B24b *31/06*
U.S. Cl. 51—7 5 Claims



This invention relates to a finishing machine having a generally cylindrical container supported at the bottom by substantially radially extending resilient members. The

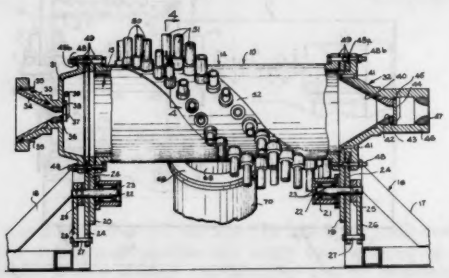
container confines media for polishing or finishing workpieces. The invention involves employing a fixture mechanism adapted to hold the workpieces to be finished which is positively reciprocated within the media throughout a 360° cycle by means of an eccentric construction of the drive shaft as the media is tumbled throughout the container by oscillation and vibration of the fixture and the container with the fixture being free to rotate on the eccentric portion of the drive shaft.

3,611,639
ABRADING MACHINES
Stewart Ives Ashworth, Malvern Link, and Anthony Gerard Field, deceased, late of Redditch, England, by Denis Cyril Field and Madeleine Helen Field, administrators, Crimond, Outhill, near Studley, England, assignors to Abrasive Developments Limited, Solihull, Warwickshire, England
Filed Aug. 19, 1969, Ser. No. 851,307
Int. Cl. B24c *3/04*
U.S. Cl. 51—8 **15 Claims**



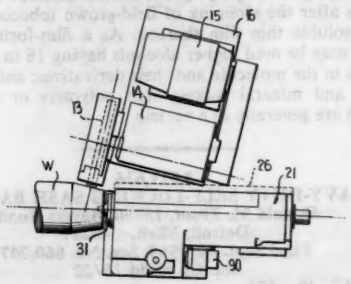
The specification discloses an abrading machine and method in which air and abrasive are directed at a workpiece in a blasting chamber which is sealed during operation by the workpiece. The abrasive is entrained in primary air, secondary air enters the chamber around the workpiece and tertiary air is allowed to mix with primary air carrying the abrasive before the latter enters the chamber. The chamber may be tubular and for treating wire or bar may be in two channel-shaped parts hinged together so that the chamber may be opened to lead the wire or bar through. Where strip is being treated the strip may pass through the tubular chamber transverse to the axis thereof.

3,611,640
ABRADING MACHINES
Stewart Ives Ashworth, Crimond, England, assignor to Abrasive Developments Limited, Solihull, Warwickshire, England
Filed Aug. 19, 1969, Ser. No. 851,354
Claims priority, application Great Britain, Dec. 17, 1968, 59,973/68
Int. Cl. B24c *3/04*
U.S. Cl. 51—8 **10 Claims**



The specification discloses an abrading machine in which air and abrasive are directed at a workpiece in a hinged, two-part tubular blasting chamber, the air and abrasive being directed at the workpiece by nozzle assemblies which are arranged so that their outlets into the chamber lie on two or more helices having coincident axes parallel to the longitudinal axis of the chamber by a distance which is small compared with the total length of the chamber. The nozzle assemblies may have their inner ends in a projection. Funnel-shaped collectors may be provided at the ends of chamber to lead wire or the like through the chamber. Closure flaps may be provided at the chamber ends to maintain the vacuum as the wire enters or leaves the chamber.

3,611,641
HEAVY DUTY TAILSTOCK
Ernest M. Woodford, Waynesboro, Pa., assignor to Landis Tool Company, Waynesboro, Pa.
Filed Oct. 31, 1968, Ser. No. 772,141
Int. Cl. B24b *5/14, 41/06*
U.S. Cl. 51—49 **10 Claims**

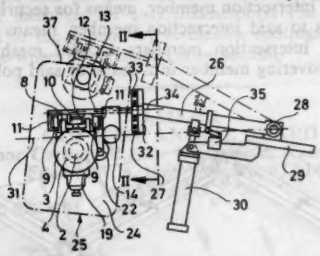


This disclosure relates to a heavy duty tailstock for machine tools, the tailstock being particularly adapted for supporting one end of a heavy workpiece. The tailstock is comprised of base members which are longitudinally positioned and secured to ways of a machine tool bed. An upper tailstock base member supports a support member or chock which is slidably mounted on slanted ways of the upper tailstock base member for longitudinal movement. The slanted ways are declined away from the general position of a tool support of the machine tool whereby the weight of the chock and that of the supported workpiece locks the chock against the slanted ways and prevents any cross movement or shifting of the chock. The chock houses a live work center, large spindle and bearings, or can be arranged to accept a dead work center. The chock is shifted longitudinally by mechanical means to engage the work center against the workpiece. The tailstock construction has eliminated that portion of the upper base member which would normally oppose the tool support, permitting increased bearing sizes and greater weight carrying capacity of the tailstock without increasing the width of the upper base member.

3,611,642
RECIPROCATING FINISHING APPARATUS
Franz Stoy, Grafenberg, Germany, assignor to Metabowerke KG Closs, Rauch & Schnizler, Nurtingen, Germany
Filed Mar. 3, 1970, Ser. No. 15,984
Claims priority, application Germany, Mar. 4, 1969, P 19 10 833.9
Int. Cl. B24b *7/00*
U.S. Cl. 51—55 **20 Claims**

A finishing tool polishes successive angular sections of the bottom of a rotating container by reciprocating between a central position and outer positions engaging the

side wall of the container. When the outwardly moving tool touches the side wall, it is resiliently displaced and

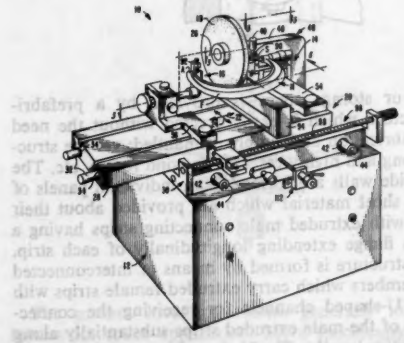


actuates a control switch causing reversal of the movement so that the tool moves away from the side wall.

3,611,643
PLANING MACHINE USING ROTATABLE ABRASIVE DRUMS
William T. Crane, Geneva, and Kenneth L. Landmark, St. Charles, Ill., assignors to Burgess-Norton Mfg. Co., Geneva, Ill.
Filed Oct. 4, 1968, Ser. No. 765,103
Int. Cl. B24b 7/12; B24d 5/00
U.S. Cl. 51—76 **5 Claims**

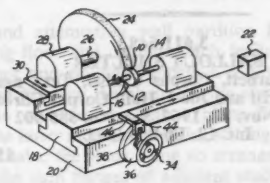
A planing means for planing wood, fibre or comparable material including a rotary drum and a metal sleeve carrying tungsten carbide grit. The sleeve is shrunk on the drum which acts as an arbor to support and rotate the grit carrying sleeve. One or more drums and grit carrying sleeve assemblies are mounted in a machine and are rotated in contact with wood or equivalent material which is to be planed and is given a smooth surface comparable to that which is given by a conventional assembly with planar blades. Such drums may be mounted solely above the workpiece or above and below the workpiece.

3,611,644
MICROMETER FINISHING MACHINE
Raymond E. Dillberg, Temple City, Calif., assignor to Dill-Rich Company, San Gabriel, Calif.
Filed Mar. 11, 1970, Ser. No. 18,671
Int. Cl. B24b 7/02, 41/06
U.S. Cl. 51—122 **9 Claims**



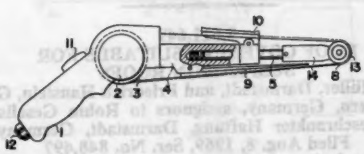
A machine for finishing the end work engaging faces of a micrometer spindle and anvil by supporting the micrometer in finishing position wherein the anvil and spindle seat in micrometer supports in straddling relation to an abrasive finishing wheel, and moving the supports and wheel relative to one another along direction lines parallel to and normal to the wheel axis to first engage each micrometer face with the adjacent face of the wheel and then oscillate the engaged faces back and forth across the wheel face.

3,611,645
FEED MECHANISM
Edward M. Newsome, Anchorville, Mich. (25700 D'Hondt Court, Chesterfield Township, Mich. 48043)
Filed Oct. 23, 1969, Ser. No. 868,713
Int. Cl. B24b 51/00
U.S. Cl. 51—165.86 **2 Claims**



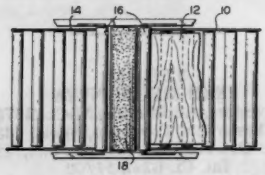
The advance or feed of a grinding wheel into a laterally traversing workpiece is actuated by and proportional to such traversing motion. Lateral movement of the workpiece-supporting traversing table causes a ratchet arm to pivot about the drive shaft which controls the feed of the grinding wheel, and a pawl on the ratchet arm engages a ratchet wheel keyed to the drive shaft to rotate the drive shaft. An adjustable shield between the pawl and the drive shaft controls when, during the stroke of the traversing table, the pawl drops into the ratchet wheel, to thereby control the depth of advance during a given cycle of the traversing table.

3,611,646
APPARATUS FOR SUPPORTING THE PULLEY OF THE BELT GRINDER
William M. Cameron, Tadao Tanoi, Kyoich Hirokawa, and Yoshio Aoki, Tokyo, Japan, assignors to Nitto Kohki Company Limited, Tokyo, Japan
Filed Oct. 23, 1969, Ser. No. 868,685
Claims priority, application Japan, Nov. 2, 1968, 43/95,285; Nov. 4, 1968, 43/80,559; Feb. 4, 1969, 44/9,358; Feb. 5, 1969, 44/9,797; Feb. 18, 1969, 44/13,509; Feb. 19, 1969, 44/14,020
Int. Cl. B24b 23/00, 21/00, 23/06
U.S. Cl. 51—170 **10 Claims**



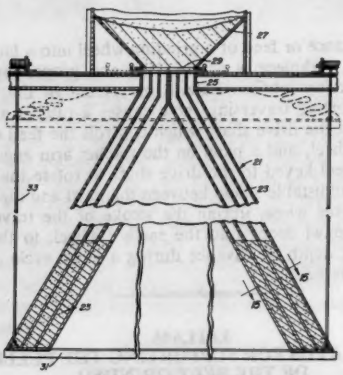
The present invention relates to a support for a pulley and more particularly to a support for a pulley of the belt grinder, the attachment angle of which is freely controlled and the tension of the grinding belt can be kept uniform.

3,611,647
PROCESS FOR TREATING SURFACE OF PLYWOOD
David C. Davis, Aberdeen, Wash., assignor to Evans Products Company, Portland, Oreg.
Filed Aug. 25, 1969, Ser. No. 852,618
Int. Cl. B24b *1/00*
U.S. Cl. 51—328 1 Claim



Architectural finish is imparted to surface of plywood by abrading surface with rapidly moving abrasive grit-carrying flexible belt.

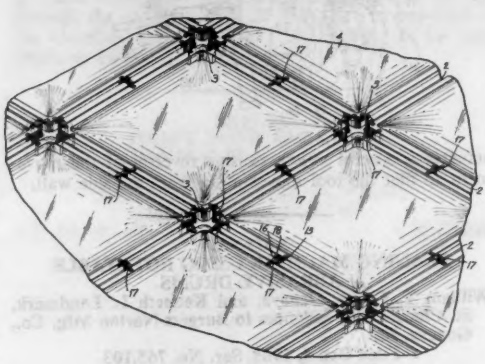
3,611,648
FALLOUT SHELTER
Frederick W. Barnett, Corpus Christi, Tex., assignor to Robert J. Sechrist and Joe J. Hall, Corpus Christi, Tex.
Filed Nov. 22, 1967, Ser. No. 685,002
Int. Cl. E04b *1/345*
U.S. Cl. 52—2 15 Claims



Radiation protection construction involving the utilization of liquid inflated or solid particle filled flexible bags or envelopes which are formed so as to define an enclosed area, either stationary or movable, for the reception of persons, animals, materials, food, etc. The fluid or particle containing envelopes will be collapsible and of a quickly erecting nature. Frame-like supporting structures will normally be utilized in connection with the support of the envelopes, however support may also be achieved by exerting internal pressure on the envelope.

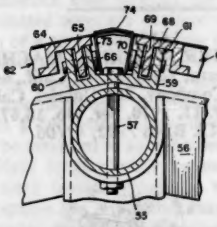
3,611,649
ROOF COVERING SUITABLE FOR SUSPENSION ROOFS
Dieter Müller, Darmstadt, and Friedrich Hanstein, Gross-Zimmern, Germany, assignors to Rohm Gesellschaft mit beschrankter Haftung, Darmstadt, Germany
Filed Aug. 8, 1969, Ser. No. 848,497
Claims priority, application Germany, Aug. 16, 1968, P 17 84 534.0
Int. Cl. E04b *7/14;* E04d *13/04*
U.S. Cl. 52—83 10 Claims

An improved suspension roof comprising a polygonal network of bar members, the length of which is substantially equivalent to the length of a side defining a mesh length in a network of mesh members of said suspension roof, at least three of said bar members pivotably joining in an intersection member, means for securing said bar members to said intersection member, means for attaching said intersection members to said mesh members, and a covering member in a shape of said polygonal



fittingly engaging with said bar and intersection members and supported by said bar members. The described roof structure allows the employment of plastic covering members which may readily be deformed by the stresses imposed on the roof and at the same time provide an easily constructed structure.

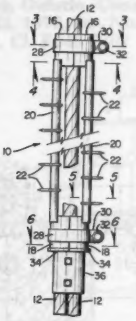
3,611,650
PREFABRICATED STRUCTURE FOR SHELTER OR STORAGE
Louis W. Horvath, 4304 Choctaw Circle Huntsville, Ala. 35801
Filed May 12, 1969, Ser. No. 823,621
Int. Cl. E04c *1/30*
U.S. Cl. 52—90 8 Claims



Shelter or storage space is provided by a prefabricated structure which is easily erected without the need for field fabrication and simply dismantled; yet the structure is strong and highly resistant to wind forces, etc. The roof and side walls are formed from individual panels of aluminum sheet material which are provided about their periphery with extruded male connecting strips having a connection flange extending longitudinally of each strip. The superstructure is formed by means of interconnected tubular members which carry extruded female strips with elongated U-shaped channels for receiving the connection flange of the male extruded strips substantially along their respective lengths. The U-shaped receptacles are provided with apertures which align with corresponding apertures in the connection flanges of the male connecting

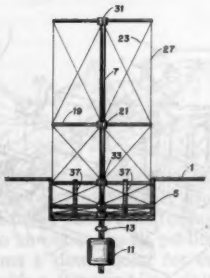
strips. Lock pins are inserted through each set of aligned apertures; and the pins are held in place by removable retainer members for easy disassembly. The structure is secured to the ground by re-useable footings resembling a paddle-wheel in horizontal cross section.

3,611,651
GUY WIRE ANIMAL GUARD
Gaynor Carlson, R.F.D. 1, Herndon, Kans. 67739
Filed Nov. 3, 1969, Ser. No. 873,166
Int. Cl. A01k *3/00*
U.S. Cl. 52—101 12 Claims



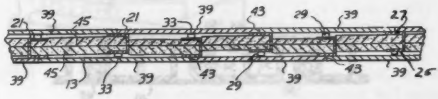
An animal guard adapted to be applied to the lower end of a guy wire disposed in an animal enclosure, without disturbing the anchors at the ends of the guy wire characterized by a two-part construction each having semi-circular ends, which may be clamped together after application to the guy wire, the ends being joined by longitudinal rods having barbs on same, the unit being freely rotatable on the guy wire after being applied thereto.

3,611,652
THERMALLY TRANSPARENT ERECTABLE BOOM
David W. Rabenhorst, Silver Spring, and Kenneth E. Darnell, College Park, Md., assignors to the United States of America as represented by the Secretary of the Navy
Filed Apr. 9, 1969, Ser. No. 814,560
Int. Cl. E04h *12/34*
U.S. Cl. 52—110 4 Claims



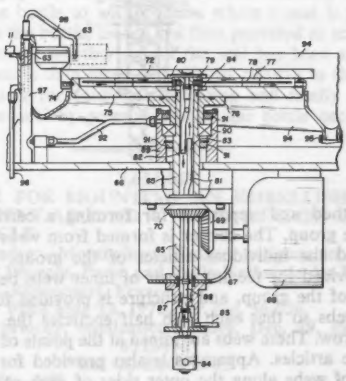
The present invention relates generally to erectable booms for space application. More specifically, the present invention provides an erectable boom characterized by increased strength, lighter weight, and relative immunity to thermal influences when compared to conventional tape booms. Although the "thermally transparent" boom of the present invention is lightweight and occupies less volume, a four-inch square unit will support bending moment orders of magnitude greater than can a conventional one-half inch diameter tape boom.

3,611,653
SOUND ATTENUATION WALL PARTITION
Daniel L. Zinn, 2545 Beaufait, Detroit, Mich. 48207
Filed Apr. 13, 1970, Ser. No. 27,671
Int. Cl. E04b *2/78*
U.S. Cl. 52—241 10 Claims



A sound attenuation wall partition for use between a building floor and ceiling which includes between opposed floor and ceiling channels, a series of spaced studs interposed between the channels, the studs each being U-shaped in cross-section with a plane flange and a stop flange, the latter including a series of longitudinally spaced yieldable tabs, the studs being so arranged that the plane flanges, the stop flanges of adjacent studs are alternately arranged, with the plane flanges bearing against and secured to the adjacent wall of a channel and the respective stop flanges laterally staggered and spaced from the adjacent wall of said channels, and opposed wallboards applied to opposite sides of said studs, the outer upright edges of each wallboard spanning and secured to the plane flanges of a pair of studs, and the intermediate upright portion of said wallboard yieldably bearing against the tabs of the intermediate stud, opposing wallboards being staggered.

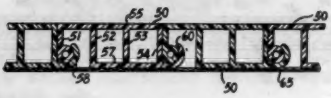
3,611,654
POLISHING MACHINE OR SIMILAR ABRADING APPARATUS
John L. Weber, Spencerport, and Carl J. Vella, Rochester, N.Y., assignors to Alliance Tool & Die Corp., Rochester, N.Y.
Filed Sept. 30, 1969, Ser. No. 862,219
Int. Cl. B24b *55/02*
U.S. Cl. 51—266 15 Claims



A polishing machine or similar abrading apparatus having a horizontal platen rotatable about a vertical axis with

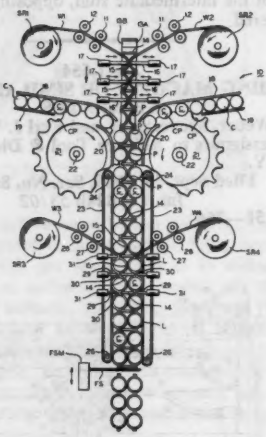
workpieces held against the platen by at least one vertically moveable support head. Cooling means are provided to maintain the operating temperature of the workpieces at desired levels by circulating coolant through the platen and the support head.

3,611,655
PORTABLE FLOOR
William Loebner, 220 W. 98th St., New York, N.Y. 10025
Filed Nov. 10, 1969, Ser. No. 875,023
Int. Cl. E04f 15/02, 15/16
U.S. Cl. 52—588 3 Claims



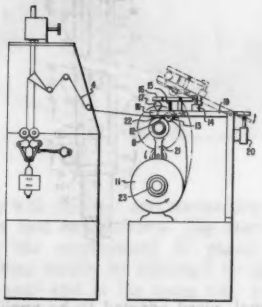
A portable floor usable as a dance floor made of a plurality of plastic, elongated slats assembled in lengthwise juxtapositioned relationship by a tongue-and-groove joint or a ball-and-groove joint between slats.

3,611,656
METHOD AND APPAPARATUS FOR FORMING CARRIERS FOR CONTAINER GROUPS
Francis A. Chidsey, Jr., Devon, Pa., assignor to Container Corporation of America, Chicago, Ill.
Filed Apr. 24, 1970, Ser. No. 31,520
Int. Cl. B65b 17/02; B65d 71/02
U.S. Cl. 53—3 12 Claims



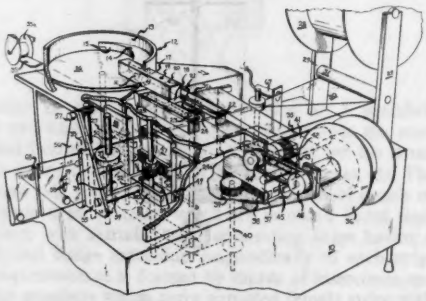
Method and apparatus for forming a carrier for an article group. The carrier is formed from webs extending around the individual articles of the group. Apparatus is provided for feeding a pair of inner webs between two rows of the group, and structure is provided for forming the webs so that each web half encircles the articles of each row. These webs are joined at the points of conjugacy of the articles. Apparatus is also provided for feeding a pair of webs along the outer sides of each row, and for joining such outer webs to the inner webs. The webs are preferably formed from thermoplastic resins having memory characteristics, and each web is stretched prior to its application to the articles, so that the article engaging loops may subsequently contract to hold the articles tightly in the loop. Alternately, the webs may be formed of paper coated with an adhesive material and capable of being adhered.

3,611,657
CONTINUOUSLY OPERATING AUTOMATIC FILLING MACHINE
Kiyoshi Inoue, Shinji Tsuchiya, and Tetsuo Ishikawa, Fukushima, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sept. 26, 1969, Ser. No. 861,317
Claims priority, application Japan, Sept. 27, 1968, 43/69,523; Sept. 30, 1968, 43/70,153
Int. Cl. B65b 57/02
U.S. Cl. 53—64 2 Claims



The leading edge of a new roll of packaging film is automatically bonded to the trailing edge of the old film roll during continuous running of an automated package filling machine and the leading end of the new roll of binding wire is automatically welded to the trailing end of the old roll of binding wire.

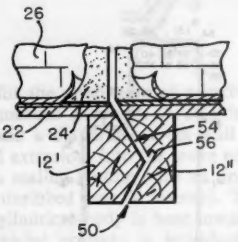
3,611,658
MACHINE FOR PACKAGING ARTICLES, SUCH AS TABLETS AND CAPSULES
Raymond J. Dwyer, 4737 Secor Road, Toledo, Ohio 43623
Filed July 22, 1969, Ser. No. 843,696
Int. Cl. B65b 9/06, 61/02
U.S. Cl. 53—131 10 Claims



A machine for packaging articles, such as tablets and capsules containing medicines, drugs, etc., in envelopes or receptacles of flexible sheet material, as for example

cohesive pressure sensitive sheet material. The tablets or capsules are delivered to a hopper, the bottom of which consists of a rapidly rotating disc which centrifugally forces the pills into a row leading to a feeder, which operates recurrently to deliver a predetermined number of pills to an envelope or enclosure as it is being formed. The sheet material is advanced step by step and during the intervals it is printed to indicate the contents, is sealed to provide a self sustaining package and optionally may be severed to provide individual units.

3,611,659
PREFABRICATED ROOF STRUCTURE
William Greenhalgh, P.O. Box 521, Oshawa, Ontario, Canada
Filed July 21, 1970, Ser. No. 56,878
Int. Cl. E04b *7/02*
U.S. Cl. 52—92 **5 Claims**



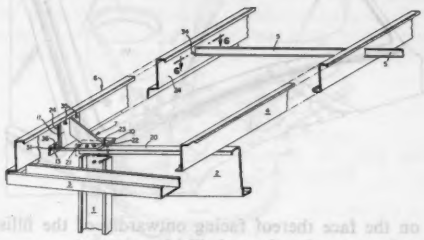
A prefabricated roof structure comprising a plurality of sections derived from an integral roof structure by the incorporation therein of means for forming accurately realignable joints between adjacent sections. The roof structure preferably includes essentially finished floor, wall and ceiling surfaces for the area defined by the roof and an essentially finished ceiling for the area beneath the prefabricated roof structure.

3,611,660
MODERN ART SIDING
Steve Costello, 236 Barrow St., Jersey City, N.J. 07302
Continuation-in-part of application Ser. No. 682,909, Nov. 14, 1967. This application May 8, 1969, Ser. No. 839,754
Int. Cl. E04d *3/30, 3/361*
U.S. Cl. 52—314 **6 Claims**

A siding apparatus for placement on a wall surface, fabricated from a plurality of similarly connected convex crescent-shaped elements whose ends form arc-shaped elements connected to an oblique angle portion which at the end integrally forms a slotted joint for detachable slidable engagement with a corresponding slotted joint of an adjacent siding. Each siding member may be fastened to the wall surface by nails received in apertures in spaced-apart relation within the interlocking portions.

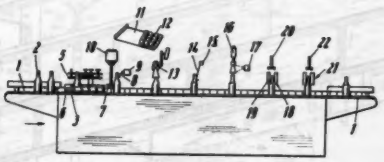
The siding apparatus permits entrapment of a desirable insulating air space between the wall surface and the siding.

3,611,661
EAVE STRUT AND BRACKET ASSEMBLY
Bruce Chambers, Belpre, and Donald Day, Guysville, Ohio, and Philip F. Uhrhane, Parkersburg, W. Va., assignors to Textron Inc., Providence, R.I.
Filed Dec. 9, 1969, Ser. No. 883,396
Int. Cl. E04b *7/04*
U.S. Cl. 52—94 **3 Claims**



An eave strut and an eave strut bracket to support the strut on the frame of a pre-engineered metal building.

3,611,662
METHOD AND APPARATUS FOR SEALING BOTTLES
Johann Heinrich Friedrich Schmitt, Nierstein (Rhine), Germany, assignor to Vereinigte Kapselfabriken Nackenheim GmbH, Nackenheim am Rhine, Germany
Filed Apr. 1, 1969, Ser. No. 812,066
Claims priority, application Germany, Mar. 12, 1969, P 19 12 458.4
Int. Cl. B67b *3/16, 5/00*
U.S. Cl. 53—14 **13 Claims**

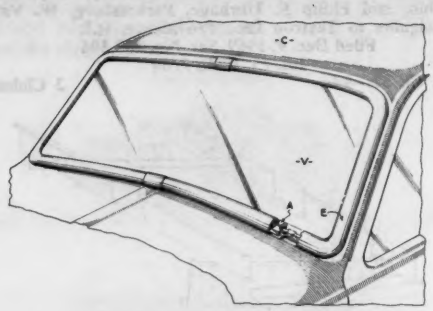


Method and apparatus for the application and fastening of prefabricated seals or crowns on champagne bottles in which the filled, corked and wired bottle is fed on a conveyor belt and glue is applied to a narrow area below the mouth of the bottle, the bottle is rotated axially in relation to the conveyor belt to position the bottle in a preferred location with respect to the seal, means are provided to grip the bottle firmly and non-rotatably and to convey the bottle to an apparatus where a seal is placed loosely on the bottle, means are then provided to scan the bottle to check whether or not the seal has been applied and the seal is then lifted and aligned relative to the subsequent tools for folding, pre-folding and finally finish-folding the seal by pressing against the bottle neck.

3,611,663
DEVICE FOR MOUNTING AN EMBELLISHING ELEMENT AROUND A FIXED WINDOW OF A VEHICLE
Michel Andrey, Montbeliard, France, assignor to Automobiles Peugeot, Paris, and Regie-Nationale des Usines Renault, Billancourt, France
Filed May 12, 1970, Ser. No. 36,626
Claims priority, application France, Dec. 19, 1969, 6918476
Int. Cl. E04b *1/62*
U.S. Cl. 52—397 **11 Claims**

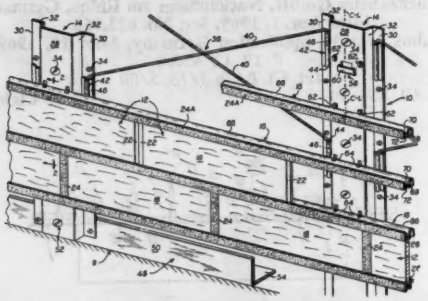
Device for mounting an embellishing strip around a glass windowpane fixed in a fillister of the body of a vehicle. The device comprises at least one mount engaged

on the edge of the glass and locked between this edge and the adjacent edge of the fillister. The or each mount



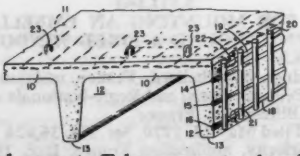
has on the face thereof facing outwardly of the fillister means for mounting the embellishing element.

3,611,664
BUILDING WALL CONSTRUCTION
Edmund C. Barbera, 55 Hillandale Road, Port Chester, N.Y. 10573
Filed Aug. 11, 1969, Ser. No. 848,923
Int. Cl. E04c *1/10*
U.S. Cl. 52—479 **14 Claims**



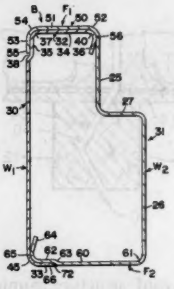
A building wall construction that includes a plurality of panel elements which are mounted on a supporting structure by means of a clamping arrangement to form a wall portion thereof, or which are supported in spaced apart relation to form a spaced wall construction.

3,611,665
SHEAR-STEEL-REINFORCED PRESTRESSED CONCRETE BEAMS
John B. O'Brien, 1426 Laurel Ave., St. Paul, Minn. 55104
Filed Dec. 30, 1968, Ser. No. 787,826
Int. Cl. E04b *5/10*
U.S. Cl. 52—723 **10 Claims**



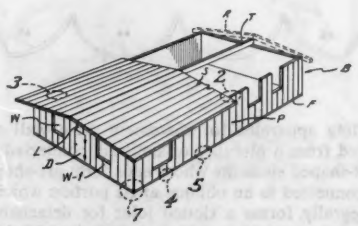
Prestressed concrete T beams are taught wherein the shear steel reinforcing is a composite structural member prefabricated and immediately suitable for placement in the leg portion of a T beam with minimum tying of it to other members. This composite shear steel reinforcing member consists essentially of a plurality of shear steel reinforcing rod elements of relatively large cross-section spaced and fixed in position along two longitudinal rods of relatively small cross-section. The rods in both directions extend beyond the points of intersection to provide an "interlocking" possibility with other elements embedded in T beam structures as well as to provide guide means for proper placement of the composite members. Bundles of these prefabricated composite members provide the T beam manufacturing industry with new flexibility and speed for the manufacture of shear steel reinforced T beams of high and reliable quality at a significant reduction in cost.

3,611,666
SHEET METAL BOX BEAM
Edward J. Poyser, Canton, and Calvin R. Clauer, Youngstown, Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio
Continuation of application Ser. No. 742,046, July 2, 1968. This application Mar. 10, 1970, Ser. No. 17,044
Int. Cl. E04c *3/07*
U.S. Cl. 52—731 **17 Claims**



A beam construction comprised of a pair of sheet metal components each having a load supporting flange. Flanges of the lipped channel components are nested together and mechanically interlocked so that portions of the beam assembly subjected to compressive stresses are reinforced, yet sectional thicknesses are minimized in other portions of the beam. The two members forming the beam mechanically interlock in a manner which permits simple assembly. Welding of the components is not necessary to develop the strength of the beam.

3,611,667
METHOD OF ERECTING A BUILDING
William K. Maxwell, Sr., Harris County, Tex. (P.O. Box 36191, Houston, Tex. 77036)
Filed June 2, 1970, Ser. No. 42,822
Int. Cl. E04b *1/00*
U.S. Cl. 52—747 **7 Claims**



A method of erecting a building by assembling a plurality of panels using adhesive mastic and splines between the panels and the foundation. Rigid bracing is used to support the panels, and each panel may include part of an electrical power system for the building. The panels are standardized and pre-cast and contain channels in the edges.

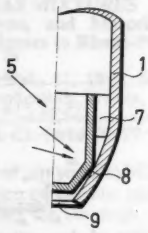
3,611,668
PROCESS FOR THE PRODUCTION OF CARBON DIOXIDE CARTRIDGES

Lajos Baldauf, Bazakerettye, Imre Radnai, Repcelak, János Vasvári, Budapest, and József Wolf, Repcelak, Hungary, assignors to Orszagos Koolaj Es Gazipari Troszt, Budapest, Hungary

Original application Apr. 1, 1968, Ser. No. 717,591. Divided and this application Apr. 29, 1970, Ser. No. 32,961

Int. Cl. B65b *31/00, 43/00*

U.S. Cl. 53—29 **3 Claims**



A process for the production of a carbon dioxide cartridge for household purposes. A cylindrical body with a neck part and a diaphragm cross wall therein is produced by cold extrusion. Into the lower end of this cylindrical body, a sealing bottom with an upper ribbed part and a lower unribbed part is inserted. The lower open end of said cylindrical body is bent inwardly, while carbon dioxide under pressure is introduced through the open end of the cylindrical body and between the ribs of the sealing bottom. Then the bending operation is finished and, if using the pressure of carbon dioxide inside the cylindrical body, the unribbed lower part of the sealing bottom is pressed onto the inner wall of the inwardly bent lower end portion of the cylindrical body so as to close it by this sealing bottom.

3,611,669
METHOD OF SHRINK PACKAGING USING CHLORINATED POLYBUTENE-1 FILM

Thomas Hugh Shepherd, Hopewell, N.J., assignor to Princeton Chemical Research, Inc., Princeton, N.J.

No Drawing. Original application Feb. 26, 1965, Ser. No. 435,688. Divided and this application July 11, 1968, Ser. No. 743,969

Int. Cl. B29c *13/00;* **B65b** *43/00*

U.S. Cl. 53—30 **7 Claims**

Chlorinated polybutene-1 film having 26–40% chlorine which has an elastic memory such that upon elongation to below the elastic limit and cooling while retaining such elongation, followed by heating to such elevated temperatures under conditions such that the film is not under restraint, the film shrinks to its original size. The chlorinated polybutene-1 film may be in foam form.

3,611,670
MACHINE FOR POSITIONING ARTICLES OF CIRCULAR CROSS-SECTION IN A PROTECTOR

Georges Baroin and Andre Guy, Thiais, France, assignors to Rhone-Poulenc S.A., Paris, France

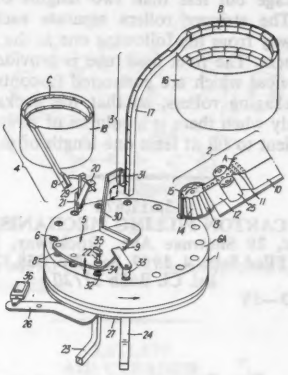
Filed Apr. 1, 1970, Ser. No. 24,736

Claims priority, application France, Apr. 11, 1969, 6911305

Int. Cl. B65b *5/04, 57/10*

U.S. Cl. 53—53 **5 Claims**

Machine for positioning ampoules in a protective packaging container, in which a rotary plate rotates about a vertical axis and has a plurality of circumferentially spaced compartments therein. Ampoules are fed one at a time from a dispenser into each compartment and a protective packaging container is dropped, at a station downstream of said dispenser, into the compartment to overlie the ampoule. A pusher then forces the



container fully over the ampoule which subsequently falls from the bottom of the compartment.

3,611,671
PACKAGING APPARATUS

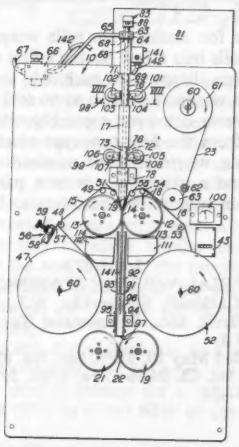
Edward A. Skinner and Thomas C. Rathbone, Welwyn Garden City, England, assignors to Aerpat A.G.

Filed July 7, 1969, Ser. No. 839,396

Claims priority, application Great Britain, July 9, 1968, 32,712/68

Int. Cl. B65b *9/12, 57/12*

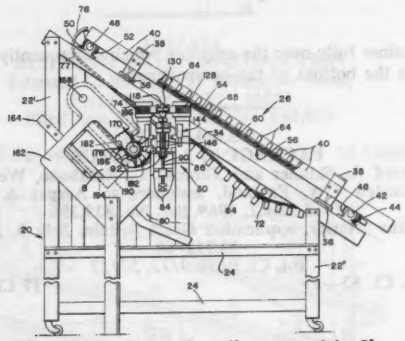
U.S. Cl. 53—59 **17 Claims**



In a machine for continuously packaging tubular rivets in end-to-end configuration, a succession of rivets is fed down a tube, with the assistance of a stream of compressed air, to a packaging station provided by the nip of two packaging rollers each having a resilient rubber surface. Two packaging tapes are fed between the packaging rollers, one tape on each side of the succession of rivets, to enclose the rivets. At least one of the tapes has an adhesive surface which is pressed into contact with the other tape by the packaging rollers. A narrow masking tape may be included to protect the column of rivets from contamination by the adhesive, if required. One of the packaging rollers is provided with a perforator blade to perforate the package into lengths each equal to the circumference of the roller. The preforated package emerging from the packaging rollers passes through the nip of a pair of stripper

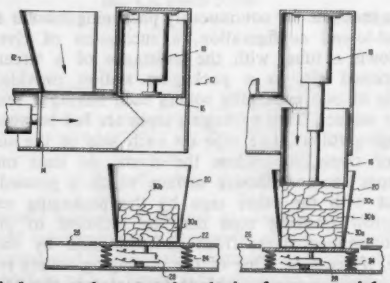
rollers, which rotate at a higher peripheral speed than the packaging rollers and are spaced from the packaging rollers by a distance greater than one length of perforated package but less than two lengths of perforated package. The stripper rollers separate each length of package away from the following one at the perforations between them. The rivet feed tube is provided with rivet sensing devices which are connected to control the drive to the packaging rollers, so that the packaging rollers operate only when there is a column of rivets in the feed tube sufficient to fill at least one length of package.

3,611,672
CARTON FILLING MECHANISM
Peter Pilat, 28 Shawnee Ave., Rockaway, N.J. 07866
Filed Sept. 4, 1969, Ser. No. 855,325
Int. Cl. B65b *57/20*
U.S. Cl. 53—59 **16 Claims**



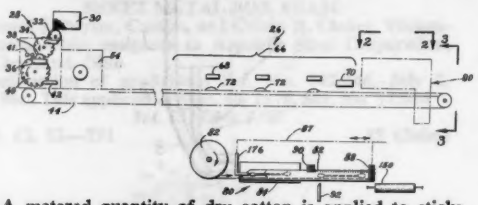
A machine for sealing coin rolls wrapped in film and loading the rolls into a box having a first conveyor assembly with heaters disposed on each side to engage the film twisted at the wrapped ends so as to seal the rolls closed, and a transverse conveyor assembly which conveys the sealed rolls from the first conveyor assembly to the box loading station where selected numbers of rolls are fed into a box and a gate responds to a particular count to divert the coin rolls to the next box to be filled.

3,611,673
MATERIAL VOLUME SENSING DEVICE
George A. Carkhuff, Somerville, N.J., assignor to Research-Cottrell, Inc., Bridgewater Township, Somerset County, N.J.
Filed May 19, 1969, Ser. No. 825,802
Int. Cl. B65b *1/24, 3/26, 57/10*
U.S. Cl. 53—74 **1 Claim**



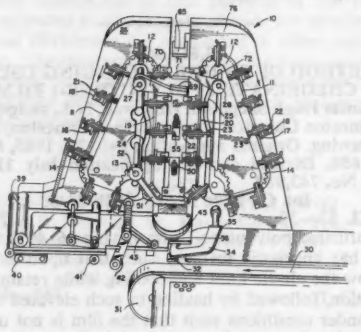
A discharge volume sensing device for a material processing apparatus having a reciprocal feeding ram. A movable material receiving support is biased to a normal position against the load of material discharged thereon and is deflected by the ram when the volume of material thereon reaches a predetermined level. Deflection of the support is sensed by a switch associated therewith.

3,611,674
APPARATUS AND METHOD FOR FORMING AND PACKAGING COTTON SWABS
Samuel W. Glickston, 111 S. Marion Place, Rockville Centre, N.Y. 11570
Filed Jan. 21, 1969, Ser. No. 792,460
Int. Cl. B65b *9/06, 51/30, 61/24*
U.S. Cl. 53—182 **1 Claim**



A metered quantity of dry cotton is applied to sticks and, using a binder material, is subsequently shaped into swabs by rollers. A conveyor transports the shaped swabs through a binder curing zone to apparatus for individually packaging the swabs.

3,611,675
APPARATUS FOR WRAPPING ARTICLES
Erhardt Walther, 10 Konradstr., 855 Forchheim, Germany
Filed Apr. 25, 1969, Ser. No. 819,254
Claims priority, application Germany, Apr. 25, 1968, P 17 61 261.2
Int. Cl. B65b *11/08, 11/54, 49/08*
U.S. Cl. 53—224 **7 Claims**



The wrapping apparatus comprises a pair of spaced endless belts each having resilient gripping members so that opposed gripping members grip an article therebetween and move a series of articles upwardly between the belts along a vertical folding path. A wrapper blank is positioned over the top face and at least two side faces of each article and the article is then moved between a pair of gripping members. As the article is moved along the folding path various folding elements engage portions of the wrapper blank extending over faces of the article to move these portions against faces of the article to completely wrap the blank around the article. The elements for folding portions of the wrapper blank are mounted on the apparatus for movement laterally into the folding path and in the direction of travel of the articles. The folding elements may also be movably mounted on the gripping members and cammed into folding relationship with

the wrapper blank portions at predetermined times. As the wrapped articles emerge from the upper end of the folding path each article is pushed laterally therefrom onto a conveyor belt.

ERRATUM

For Class 55—240 see:
Patent No. 3,611,592

3,611,676
PROCESS FOR THE SEPARATION OF GAS MIXTURES

Gilbert Christen, Lyon, and Marcel Lefort, Caluire, Rhone, France, assignors to Rhone-Poulenc S.A., Paris, France

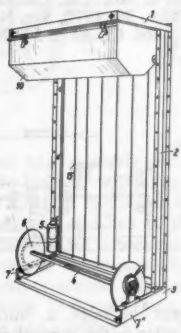
No Drawing. Filed Feb. 11, 1969, Ser. No. 798,468
Claims priority, application France, Feb. 12, 1968, 139,541
Int. Cl. B01d *59/12*
U.S. Cl. 55—16 **3 Claims**

Membranes made of vinyltrialkylsilane polymers are useful for the separation of gaseous mixtures by selective diffusion of the mixture therethrough.

3,611,677
AUTOMATIC ROLLER BAND AIR FILTER ASSEMBLY

Gerhard Max Neumann, Berlin, Dahlem, Germany, assignor to Delbag-Luftfilter GmbH, Berlin, Germany

Filed Nov. 13, 1968, Ser. No. 775,281
Claims priority, application Germany, Nov. 27, 1967, D 37,034
Int. Cl. B01d *46/18*
U.S. Cl. 55—354 **5 Claims**



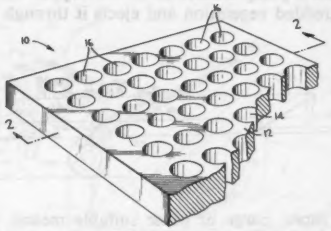
In automatic roller band filter assemblies for filtering air, the filter band passes from one bobbin in an upper portion of the assembly through an intermediate sealed filter portion to a driven bobbin in a lower portion of the assembly with separate adjustable deflecting units in the upper and lower portions.

3,611,678
ACTIVATED CARBON FILTER

Herbert K. Holden, Bon Air, Va., assignor to American Filtrona Corporation, Richmond, Va.

Filed Oct. 3, 1968, Ser. No. 764,788
Int. Cl. B01d *53/04*
U.S. Cl. 55—387 **9 Claims**

A bonded charcoal filter and a method for making the same are disclosed. The filter contains fine powdered activated charcoal and a thermosetting or thermoplastic resin binder, and is a self-contained disposable filter having voids in sufficient amount to provide a pressure drop of about 0 to about 0.5 inch of water at a face velocity of up to approximately 450 feet per minute. The method includes mixing the dry ingredients and sufficient water,

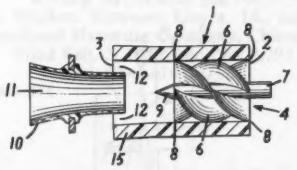


charging to a mold, applying sufficient pressure, and curing the resulting filter.

3,611,679
AIR CLEANER

David B. Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of application Ser. No. 646,903, June 19, 1967, and a continuation of application Ser. No. 738,371, May 31, 1968. This application Jan. 29, 1970, Ser. No. 7,390
Int. Cl. B01d *45/12*
U.S. Cl. 55—457 **16 Claims**



Air cleaners are provided particularly suited for use as one of an array of closely spaced air cleaners for efficiently removing contaminant particles from relatively high velocity air with a low pressure drop. The air cleaner has a tubular body, with an inlet at one end, an outlet at the opposite end, and a central passage therebetween, and a deflector coaxially mounted in the passage adjacent the inlet creating a vortex stream of influent air in the passage, with a generally coaxially tubular outlet member positioned within the outlet end of the tubular body, separating the contaminant particles at the periphery from relatively clean air at the core of the turbulent flow of air through the passage.

In one embodiment, the passage has an inside diameter of less than about one inch, and the vanes of the deflector extend along the central passage for a length within the range from about 50% to about 60% of the total length of the passage.

In another embodiment, the pitch length in inches of the vanes of the deflector and the inside diameter in inches of the central passage of the tubular body have a relationship that is expressed according to the equation $Pl=Kd^{.68}$, in which K is within the range from about 2.2 to about 3.2.

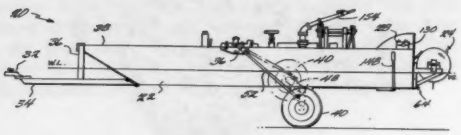
3,611,680
MACHINE FOR REMOVING VEGETATION FROM WATERWAYS

Ray V. Hendrickson, 235½ 33rd St., West Palm Beach, Fla. 33407

Filed May 2, 1969, Ser. No. 821,448
Int. Cl. A01d *45/08*
U.S. Cl. 56—9 **10 Claims**

An apparatus for removing vegetable matter from waterways comprises a hull having an eccentric rotary rake which gathers vegetation from the waterway, a

shredder which receives the vegetation from the rake and shreds the vegetation so that it can be easily disposed of, a hopper into which the shredded vegetation is deposited and a pump connected to the hopper which picks up the shredded vegetation and ejects it through a nozzle

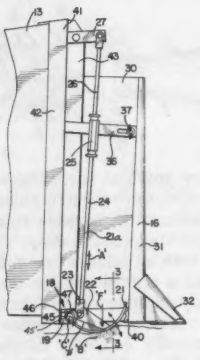


onto the shore, barge or other suitable means. The hull is self-propelled by water jets and is provided with retractable wheels so that the hull can be towed to and from the waterway after which the wheels are retracted so that they will not interfere with the operation of the apparatus even in extremely shallow water.

3,611,681
AUTOMATIC UNIT HEIGHT CONTROL FOR COTTON HARVESTER

Albert G. Blanton, Wyatt T. Gable, Jr., Paul J. Hulseberg, and Forrest L. Simpson, Memphis, Tenn., assignors to International Harvester Company, Chicago, Ill.

Filed Nov. 24, 1969, Ser. No. 879,052
Int. Cl. A01d *45/18*
U.S. Cl. 56—10.4 **8 Claims**



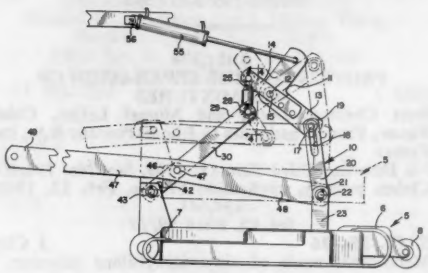
A ground contour sensing shoe for use with a system to automatically control the height of a harvesting unit movably mounted on a field-going carrier, the shoe having a pivotal connection to the harvesting unit and including a drag producing area of engagement with the ground which is located forwardly and below that connection to provide during operation a moment of rotation about the connection effecting a bias of the shoe toward the ground at the area of engagement to make the shoe less responsive to minor variations in soil texture and surface irregularities without substantially effecting its responsiveness to ground contour.

3,611,682
MOWER MOUNTING LINKAGE

Jerrold A. Isaacson, Lombard, Robert B. Swallow, Oaklawn, and Ross M. Lathrop, Downers Grove, Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 6, 1970, Ser. No. 999
Int. Cl. A01d *35/26*
U.S. Cl. 56—14.9 **10 Claims**

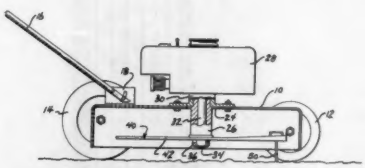
Self-leveling linkage which is effective to position a mower from the underside of a tractor by means of a single rockshaft generally parallel with the ground. The linkage comprises front and rear lift links connected at their upper ends to opposite ends of a libratory lever which is connected intermediate its ends to the rockshaft. The lower ends of the lift links are connected to the front and rear ends of the mower and the rear links are pivoted intermediate their ends to a pair of draft links intermediate their ends. The draft links are pivoted at their forward ends to the forward end of the mower coaxial with the lower ends of the front lift links and extend over the mower and have rear end portions pivoted to the tractor behind the mower. The amount of lift of the front of the mower by the front links is concurrently equalized by the linkage in lifting the rear end of the mower.



3,611,683
ROTARY LAWNMOWER ATTACHMENT

Eskil W. Swenson, Rockford, Ill., assignor to Swenson Spreader & Mfg. Co., Lindenwood, Ill.

Filed Mar. 30, 1970, Ser. No. 23,678
Int. Cl. A01d *51/00*
U.S. Cl. 56—16.1 **11 Claims**



The attachment includes a horizontal carrier bar mounted at its center to the vertical power output shaft of the rotary lawnmower, in place of the usual cutter blade. A single rake finger is resiliently mounted at one end of the carrier bar for tilting movement both radially and circumferentially of the direction of rotation of the carrier bar. The carrier bar is formed with two edges bent upwardly to retain the resilient mounting means and with a relatively large opening to balance the attachment and prevent buildup between the upwardly bent edges.

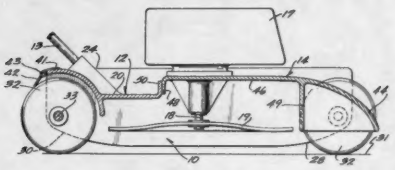
3,611,684
SAFETY SIDEWALL LAWN MOWER

Finn T. Irgens, Milwaukee, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of application Ser. No. 609,076, Jan. 13, 1967. This application Feb. 20, 1970, Ser. No. 14,713
Int. Cl. A01d *35/26*
U.S. Cl. 56—17.1 **12 Claims**

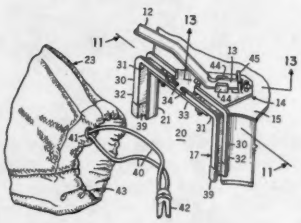
Disclosed herein is a rotary mower with safety sidewalls which depend from a blade housing section, which are at a constant clearance from the ground and which afford protection from ejection of missiles from beneath

the mower. The sidewalls have wheel means for transporting the mower along the ground. The engine and blade are supported on a housing section which is located



between the sidewalls and is vertically adjustable relative to the sidewalls to vary the height of grass cut. A roller between the rear wheels prevents rearward ejection of missiles.

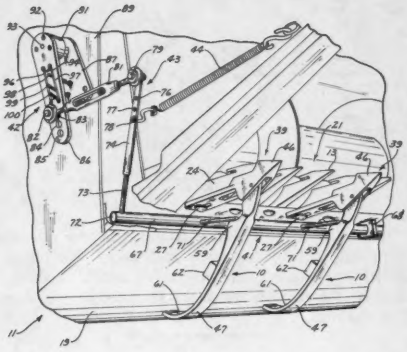
3,611,685
GRASS CATCHER ASSEMBLY
Stanley F. Allina, Ladue, Mo., assignor to The Perfection Manufacturing Company, St. Louis, Mo.
Filed Dec. 4, 1967, Ser. No. 687,700
Int. Cl. A01d *53/06*
U.S. Cl. 56—202 **7 Claims**



The grass catcher bag assembly includes an adaptor plate attached to the lawn mower housing above the discharge orifice, and a single cantilever support arm constructed in two parts and attached to the adaptor plate. The adaptor plate includes an overhanging support member to which angle-shaped frames are adjustably attached. The angle-shaped frames and the adaptor plate cooperate to form a substantially U-shaped frame in register with the discharge orifice and adapted to receive the open end of the bag. The other end of the bag attaches to the outer end of the cantilever support arm. The adaptor plate includes a pair of tabs engaging the inner end of the support arm and a socketed lug spaced from the tabs and engaging the inner end of the support arm to provide a couple attachment means securing the support arm to the adaptor plate.

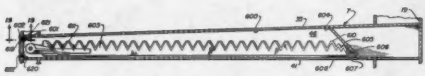
3,611,686
AUTOMATIC HEADER CONTROL APPARATUS
Ferne R. Van Antwerp, Plano, Iowa 52581
Filed June 13, 1967, Ser. No. 645,740
Int. Cl. A01d *67/00*
U.S. Cl. 56—208 **7 Claims**

This invention relates to harvesters in general, and more particularly to the ground engaging feelers or sensors associated with automatic header controls. The sensors of the present invention are independent of each other, are mounted on the cutter blade finger guards, and are also independently movable relative to a rock shaft or sensor follower. An ancillary phase of the invention relates to an improved mechanically operable electric switch responsive to the sensor follower, which switch has a plurality of independent, parallel contacts bendable into



simultaneous contact with either of a pair of spaced bars electrically connected to a main header control switch.

3,611,687
KNIFE STORAGE DEVICE
John A. Walker, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed Feb. 5, 1970, Ser. No. 8,794
Int. Cl. A01d *55/02*
U.S. Cl. 56—271 **10 Claims**

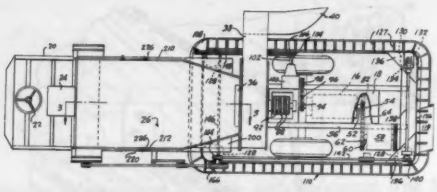


A mower conditioner having a frame with an elongated transverse tapered beam member of box-section forming a storage compartment for a spare long sickle as a replacement for the sickle of the cutting device at the front end of the harvester, an opening is provided at the narrow end of the beam for inserting and withdrawing the sickle and a guide wall is provided at the inner end of the compartment to hold the sickle from excessive bouncing. A closure cover is secured to the open end of the beam and has a pair of embossed lugs thereon fitting into the opening for abutment with opposite walls of the beam to prevent the spring pressed pivoted cover from turning to open position.

3,611,688
NUT HARVESTING MACHINE
Morton F. Phelps, Little Rock, Ark., and William D. Phelps, Jr., 9417 New Benton Highway, Little Rock, Ark. 72204; Morton E. Phelps and William D. Phelps executors of said Morton F. Phelps, deceased
Filed Sept. 13, 1968, Ser. No. 759,717
Int. Cl. A01g *19/00*
U.S. Cl. 56—328 **10 Claims**

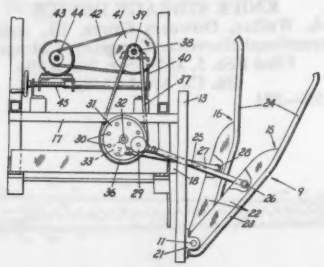
A self-propelled nut harvesting machine, for picking up nuts along with unwanted trash from the ground and separating the nuts from the trash, including a wheeled chassis with a power source, a nut receiving nozzle, a trash separating chamber communicating at one end with the nozzle and at the other end with suction means, a trash discharge outlet on the suction means, and an air lock connected to the separating chamber for receiving

and discharging clean nuts. The separating chamber includes means for moving the entering stream of air containing nuts and trash vertically from the nozzle, means for turning said stream to move horizontally toward the suction means, a baffle for reversing a portion of the



stream at increased velocity to flow oppositely and upwardly and thereby separate and carry the trash away from the nuts, and duct means for again reversing said portion of the stream carrying trash to flow toward said suction means.

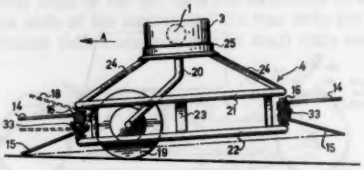
3,611,689
BEATER ASSEMBLY FOR RASPBERRY HARVESTER
Albert W. Patzlaff, Holland, Mich., assignor to Blueberry Equipment, Inc., South Haven, Mich.
Filed May 25, 1970, Ser. No. 41,124
Int. Cl. A01g *19/00*
U.S. Cl. 56—330 **11 Claims**



A mobile row crop straddling harvester has beaters pivoted to swing inwardly against opposite sides of the crop. The beaters on one side are staggered longitudinally behind the beaters on the other side. All of the beaters are formed of longitudinally extending and vertically spaced beater rods. The beaters on each side consist of vertically spaced upper and lower beater sections. Both sections are oscillated by a common drive, and the lower section has a single amplitude drive pin. The upper section is driven at a greater amplitude, and its drive pin is angularly adjustable to drive the upper beater in selectively different leading or trailing relation with respect to its associated lower beater section. The beaters on opposite sides engage the crop successively; and the action produces undulating, vertically irregular, bending or whipping movement of the crop canes engaged by the beater bars.

3,611,690
AGRICULTURAL IMPLEMENT SUCH AS A HAYMAKER
Petrus Wilhelmus Zweegers, Nieuwendijk 46, Geldrop, Netherlands
Filed June 2, 1970, Ser. No. 42,774
Claims priority, application Netherlands, June 5, 1969, 6908537; July 11, 1969, 6910757
Int. Cl. A01d *81/00*
U.S. Cl. 56—366 **15 Claims**

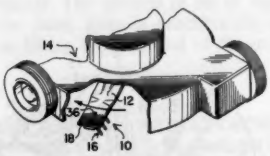
The invention relates to an agricultural implement such as a haymaker, with one or more tine carrying wheels which rotate in a forwardly inclined plane. The tines are pivotally connected to the wheels and are held outwards by centrifugal force when the wheel rotates. But when the wheel is stopped, the tines pivot upwardly under the action of a spring.



The tines may be adjustable and their operative position may be limited by stops.

In an implement with two adjacent tine carrying wheels, a crop separation board or rack may be mounted between and forwardly of the wheels.

3,611,691
RAKE ATTACHMENT FOR ROTARY POWER MOWER
Orvel Howard, P.O. Box 222, Rock Falls, Ill. 61071
Filed May 28, 1970, Ser. No. 41,382
Int. Cl. A01d *81/00*
U.S. Cl. 56—367 **10 Claims**

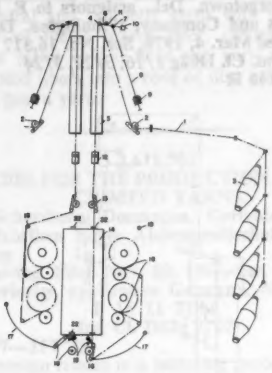


A plurality of spaced parallel tines project beneath the trailing edge of a rotary motor blade. Each tine includes a substantially straight generally horizontal portion which is secured to the undersurface of the mower blade by a clamping mechanism. The tine projects from the horizontal portion downwardly and at an angle to the horizontal mower blade. Each tine also includes a tip portion adjacent the end of the horizontal portion which is bent to lie in a plane perpendicular to the longitudinal axis of the horizontal portion. This end tip is secured by a clamping mechanism to prevent rotation of the tine within the clamping mechanism. Various clamping mechanisms include at least one plate having spaced parallel channels which accommodatingly receive the horizontal portions of the tines. The tines may be either received between two such plates or clamped between the undersurface of the mower blade and a single plate. A notch in one of the channeled plates accommodates the bent tip at the end of the horizontal portion and thus prevents rotation of the tine. In an alternate embodiment, two tines are joined by a single reach at the distal end of the horizontal portions which acts as a stabilizer in lieu of the bent tip portions.

3,611,692
FALSE TWIST CRIMPING APPARATUS
Hermann Kubler, Remscheid-Lennep, and Heinz Treptow, Ennepetal-Milspe, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany
Filed July 18, 1969, Ser. No. 843,142
Claims priority, application Germany, Sept. 27, 1968, P 17 85 466.9; Dec. 31, 1968, P 18 17 617.5
Int. Cl. D02g *1/02;* **D02j** *13/00;* **D01h** *7/92*
U.S. Cl. 57—34 **14 Claims**

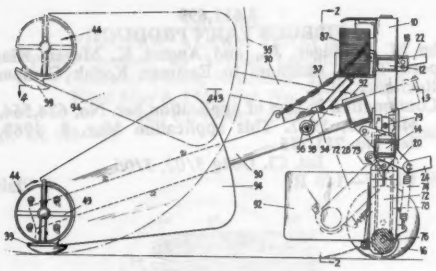
False twist crimping device for yarns, including filamentary materials such as those made of artificial fibers, com-

prising false twist units, first and second yarn-heating devices preceding and following each unit, winding devices disposed after the false twist units and adjacent the second



heating device with optional second heating device by-pass, and yarn delivery means arranged laterally adjacent to or on the machine.

3,611,693
ROLL FORMING FODDER HARVESTERS
William Richard Clifford Geary, Flat 4, 18 Kensington Road, South Yarra, Victoria, Australia
Filed Dec. 29, 1969, Ser. No. 888,354
Int. Cl. A01d *39/00*
U.S. Cl. 56—343 **14 Claims**

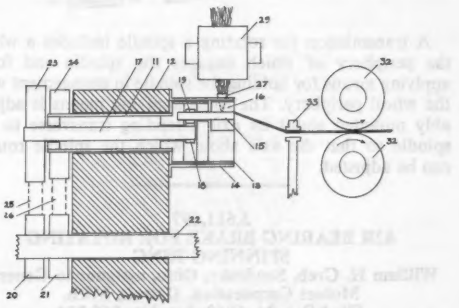


The invention relates to improvements in a roll forming fodder harvester of the kind adapted to lay a plurality of flexible members longitudinally beneath a windrow of mown fodder and then to wind the fodder together with the flexible members about at least one transversely arranged rotatable core member to form a roll. The core member is supported so that it may be raised and lowered and also moved approximately axially, i.e. laterally towards and from the windrow.

3,611,694
METHOD OF AND APPARATUS FOR THREADING IN THREADS ON DRAWTWISTING OR DRAW-WINDING MACHINES, AND IMPROVED KNOT USED IN THE PERFORMANCE OF SAID METHOD
Rudolf Jaeggli, Bern, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland
Filed Aug. 1, 1969, Ser. No. 846,727
Claims priority, application Switzerland, Aug. 8, 1968, 12,118/68
Int. Cl. D01h *1/22, 1/30, 15/00*
U.S. Cl. 57—34 **25 Claims**

There is disclosed an improved method of and apparatus for threading in threads on drawtwisting or draw-winding machines or similar machines. According to the invention the thread is severed between an undrawn creel package which is becoming exhausted and a thread feed mechanism and the thread end running or extending towards the feed mechanism is held in a ready or preparatory position. The creel package which is being exhausted is replaced by a full creel package and a connection is established between the thread end of the full creel package and the aforementioned thread and extending towards the feed mechanism. According to an important aspect of the invention, the drawing ratio imparted to the thread is reduced during such time as the previously established thread connection passes through a drawing zone. There is also disclosed an improved knot for the connection of the thread ends which provides one technique of reducing this drawing ratio without the aid of mechanical means.

3,611,695
OPEN END SPINNING
Hugh M. Brown, P.O. Box 1223, Clemson, S.C. 29631
Filed Jan. 22, 1970, Ser. No. 4,811
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.89 **16 Claims**



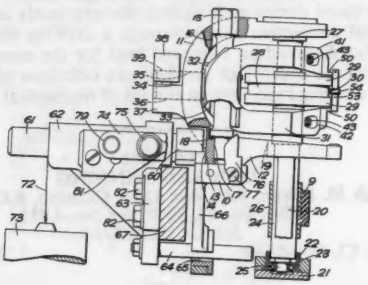
Textile apparatus capable of spinning, that is, drafting and twisting, yarn directly from staple fiber in conventional untwisted sliver form. Such apparatus includes a staple fiber assembly device having a relatively slowly moving endless fiber carrying surface such as a roll to be orbitally rotated about an axis at high speed for intermittently acquiring to its surface a relatively few fibers positively extracted from the end of a sliver at a fixed fiber transfer point on a more or less smooth surface for a permanent nipping contact with fiber carrying surface to intermittently remove a predetermined amount of fibers from the end of the sliver and transfer them directly and positively onto the fiber carrying surface in overlapping configuration to draft them. The transferred fibers are slowly advanced by the fiber carrying surface to a yarn transfer point on the carrying surface, maintaining a firm control grip between the fiber carrying surface and the smooth surface, while moving the acquired fiber assembly

in a circular path on the smooth surface, creating a rapidly rotating continuous fiber holding point toward which drafted fibers in overlapping configuration are continuously advanced on the slowly moving fiber-carrying surface. The twisting phase in which the fibers are twisted into yarn takes place in a spinning zone extending from the yarn transfer point on the fiber carrying surface and a stationary yarn delivery means, such as a pair of cooperating delivery rolls, providing a yarn holding point spaced from the yarn transfer point. The fiber carrying roll thus serves simultaneously as fiber detaching means to remove fibers at the fiber transfer point from the end of the input sliver and as a positive nip at the yarn transfer point to provide a suitable tension in the twisting zone. The completed yarn passing from the yarn delivery rolls may be wound into a package of any desired size and configuration.

3,611,696
TRANSMISSION MEANS FOR ROTATING SPINDLES

Denis Albert Edward Mattingly, Enfield, England, assignor to Ernest Scragg & Sons Limited, Macclesfield, England

Filed Apr. 3, 1970, Ser. No. 25,532
Int. Cl. D01h *7/46, 7/92*
U.S. Cl. 57—77.45 **8 Claims**

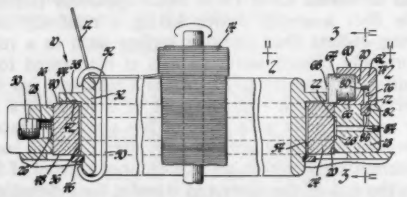


A transmission for rotating a spindle includes a wheel the periphery of which engages the spindle and force applying means for holding the spindle in engagement with the wheel periphery. The force applying means is adjustably mounted about an axis extending transverse to the spindle so that the axis about which the spindle rotates can be adjusted.

3,611,697
AIR BEARING BRAKE FOR ROTATING SPINNING RING

William H. Greb, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 24, 1969, Ser. No. 869,233
Int. Cl. D01h *7/56*
U.S. Cl. 57—124 **4 Claims**

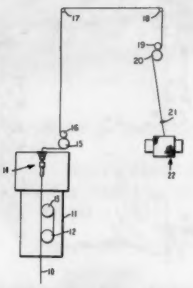


A textile spinning ring having a gas bearing supported traveller ring is provided with a gas-operated brake. The brake is powered from the gas bearing supply plenum and is maintained in the disengaged position through a venturi effect.

3,611,698
HEAVY DENIER CRIMPED AND ENTANGLED YARN

Murray Herman Horn, Wilmington, and Thomas Larson Nelson, Georgetown, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 4, 1970, Ser. No. 16,517
Int. Cl. D02g *1/16, 3/22, 3/24*
U.S. Cl. 57—140 R **10 Claims**

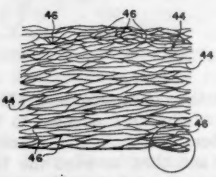


Heavier denier crimped yarns of continuous filaments are disclosed wherein filament crimp and entanglement provide a combination of elastic and stabilized bulk which is particularly desirable for tufted, cut-pile fabrics. The yarn bulk and cohesiveness is such that there is little blooming or expanding of the cut ends and the tufts remain upright, so that good tuft definition is maintained when carpets are subjected to heavy traffic. An economical fluid jet process for producing the novel yarn is disclosed.

3,611,699
FIBROUS YARN PRODUCT

John M. Wininger, Jr., and August K. Meyer, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of application Ser. No. 624,564, Mar. 20, 1967. This application Mar. 8, 1968, Ser. No. 711,775
Int. Cl. D02g *3/02, 3/06*
U.S. Cl. 57—140 R **4 Claims**



A textile product manufactured from a cellular thermoplastic film which is slit into ribbons that are subsequently oriented to give them strength. Such ribbons when processed into woven fabrics or the like fracture into interconnected filaments having the appearance and hand of yarn but having sufficient coherency that twisting is not required.

3,611,700
PROCESS FOR OBTAINING A FIBER YARN FROM METAL COATED FILM

Antoine Vivien, Paris, France, assignor to La Cellophane, Societe Anonyme, Paris, France

No Drawing. Filed Sept. 19, 1969, Ser. No. 859,556
Claims priority, application France, Sept. 25, 1968, 167,498
Int. Cl. D02g *3/02*
U.S. Cl. 57—157 R **3 Claims**

A process for the preparation of a fiber yarn which contains metal coated fibers, which process comprises cutting a metal coated film into extremely fine strips, which metal coated film consists of a metal coating on a

base selected from the group consisting of artificial and synthetic materials, gathering the resulting fine strips into bundles, combining yarns selected from the group consisting of natural and synthetic yarns with said bundles of fine strips of metal coated fiber, cutting the resultant bundles of metal coated fiber and yarn into fibers, and gathering said fibers into a rove of fiber suitable for transformation into a yarn.

3,611,701
PROCESS FOR THE PRODUCTION OF DYED CRIMPED YARNS

Herbert Scherzberg, Dormagen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

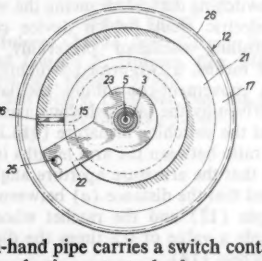
No Drawing. Filed Nov. 20, 1969, Ser. No. 378,563
Claims priority, application Germany, Nov. 29, 1968, P 18 11 718.5
Int. Cl. D02g *1/02*
U.S. Cl. 57—157 TS **3 Claims**

The invention relates to a texturing process for the production of dyed, crimp yarns from endless filaments by the false-twist method. The endless filaments consist of synthetic polymers, such as high-molecular weight linear polyamides or high-molecular weight linear polyesters. The process is carried out by making up the endless synthetic filaments issuing from a spinning station by knitting into a tubular structure, being dyed in that form, the filaments then being stretched and false-twist-crimped. The knitting machine required to produce the tube is arranged immediately beneath the spinning station. The false-twisting is effected at temperatures of above 100° C.

3,611,702
ELECTRIC ALARM TIMEPIECE

Paolo Spadini, 88 Avenue Leopold-Robert, La Chaux-de-Fonds, Neuchatel, Switzerland

Filed May 8, 1969, Ser. No. 822,881
Int. Cl. G04c *21/16*
U.S. Cl. 58—19 **6 Claims**



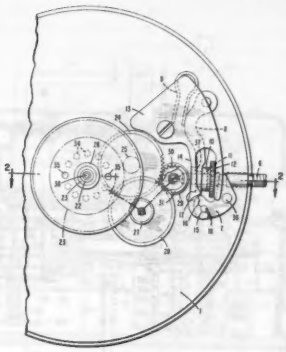
The alarm-hand pipe carries a switch contact embedded in a synthetic plastic contact wheel to expose one surface, the other contact of the switch being carried by the hour wheel to slide over the contact wheel and to make contact with the first contact when at the position of the latter. The dial supports the contact wheel against axial movement, and the only friction between the hour and contact wheels is that of the one contact sliding over the contact wheel.

3,611,703
WATCH FOR INDICATING TIME OF TWO GEOGRAPHIC ZONES

Jean-Louis E. Borel, Neuchatel, Switzerland, assignor to Synchron S.A. Neuchatel, Neuchatel, Switzerland

Filed Feb. 17, 1970, Ser. No. 12,046
Claims priority, application Switzerland, Feb. 20, 1969, 2,580/69
Int. Cl. G04b *19/22*
U.S. Cl. 58—42.5 **8 Claims**

Besides the conventional hour hand, the watch comprises an extra hour hand driven together with the conventional hour hand by the motion work, but which can be set separately by the stem when the latter is in an intermediate axial position. A winding and hand-setting mechanism of conventional type ensures winding and setting the conventional hands together with the extra

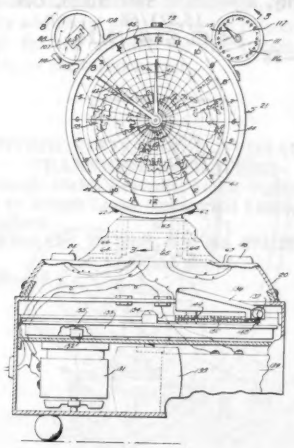


hour hand in the usual manner. In the intermediate control position of the stem the clutch wheel meshes only with an extra setting pinion actuating the extra hour hand and having teeth longer than the conventional setting pinion.

3,611,704
UNIVERSAL CLOCK WITH CALENDAR AND ANNUNCIATOR MEANS

Gorgonio T. Guintos, Hinobaan, Negros Occidental, Philippines

Filed Dec. 5, 1969, Ser. No. 882,531
Int. Cl. G04b *19/24*
U.S. Cl. 58—44 **6 Claims**

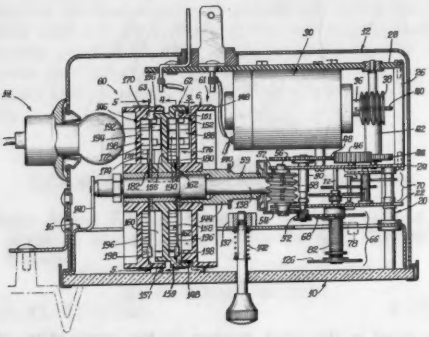


A clock consists of a pair of rotary dials and cooperating clock hands. One dial represents the northern hemisphere of the earth and the other dial the southern hemisphere. A drive motor and gearing power the dials and clock hands in such a manner that accurate time is indicated at various degrees of longitude in both hemispheres. A calendar indicator is coordinated with the clock gearing. The base of the clock contains an annunciator which may sound the time at various points on the earth.

3,611,705
DIGITAL CLOCK WITH NOVEL INDEXING DRUMS

Emil J. Niznik, Lake Geneva, Wis., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Feb. 2, 1970, Ser. No. 7,469
Int. Cl. G04b *19/30*
U.S. Cl. 58—50 7 Claims

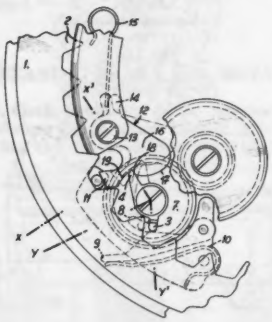


A digital clock having a plurality of drums showing the hours and minutes, and a Geneva movement having gear elements at the periphery of the drums, for greater accuracy and positioning of the drums.

3,611,706
CALENDAR WATCH

Raymond Polo, La Chaux-de-Fonds, Switzerland, assignor to Fabrique Movado and Fabrique des Montres Zenith S.A., La Chaux-de-Fonds and Le Locle, Switzerland

Filed Sept. 29, 1969, Ser. No. 861,842
Claims priority, application Switzerland, Oct. 17, 1968, 15,521/68
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 8 Claims

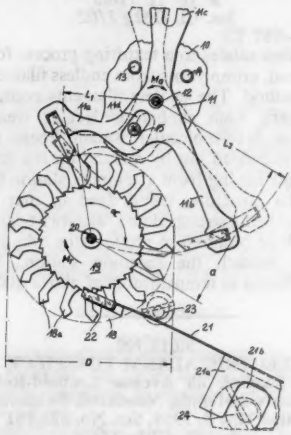


A calendar watch having a momentary action date-indicating mechanism which is controlled jointly by kinematically interconnected driving and locking means which include a spring-loaded pivoting locking lever and a rotatable beak co-operating with the latter and with an internally toothed date-indicator ring. A driving wheel revolving about the same axis as the beak drives the latter by a pin-slot type of coupling, the beak having a projection in the form of a pin which co-operates with an arcuately-shaped slot extending through the driving wheel.

3,611,707
CONTINUOUS-SWITCHING DEVICE FOR ADVANCING THE WHEEL MECHANISM OF AN ELECTRIC CLOCK

Gunther Scholz, Schramberg, Germany, assignor to Messrs. Gebruder Jungshans G.m.b.H., Schramberg, Germany

Filed Nov. 12, 1969, Ser. No. 875,646
Claims priority, application Germany, Nov. 21, 1968, G 68 07 990
Int. Cl. G04b *15/00*
U.S. Cl. 58—116 3 Claims



Continuous-switching device advancing the wheel mechanism of an electric clock, which device comprises a movement-controlling oscillator preferably driven by electromagnetic means, a two-armed switching armature driven by this movement-controlling oscillator, and a ratchet wheel driven by the said switching armature, characterized in that the switching armature (**11**) is unequally armed and the ratio between the arm lengths is about 2:3, furthermore in that the armature aperture angle equals or exceeds 90°; and that the distance (*a*) between the switching armature pin (**12**) and the ratchet wheel pin (**20**) equals or exceeds a value of 0.8 times the diameter (D) of the ratchet wheel (**18**).

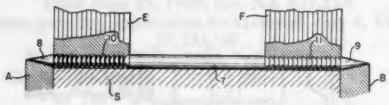
3,611,708
TWO-LEGGED WIRE STAPLE AND METHOD OF MANUFACTURE INVOLVING ROLL-FORMING

Haden M. Moore and Robert H. Reed, Sterling, Ill., assignors to Redmore Products Company, Sterling, Ill.

Filed Jan. 13, 1969, Ser. No. 790,801
Int. Cl. B21g *7/02*
U.S. Cl. 59—77 2 Claims

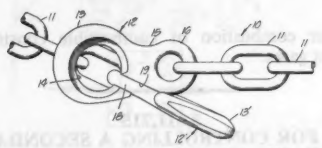
The opposite ends of a straight elongated round wire blank are roll-swaged between dies to provide conical points while the adjacent end portions are simultaneously ring-formed against other dies to produce annular ridges and grooves for greater holding power of the staple in wood, these latter dies serving incidentally to grip the blank to prevent endwise displacement relative to the first dies. A two-legged staple is then produced in a U-bending operation. This method involves lowest possible manufacturing cost and there is a big saving by virtue of the

virtual elimination of wasted material, while the resulting staple is of superior quality, easier to drive and with less



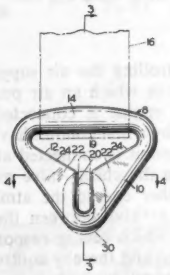
likelihood of splitting the wood, and possessing stronger holding power than other two-legged staples.

3,611,709
MULTIPLE PURPOSE LOG CHAIN
Alvin S. Bilbey, 939 E St., Taft, Calif. 93268
Filed Feb. 9, 1970, Ser. No. 9,530
Int. Cl. F16g *15/00*
U.S. Cl. 59—93 **5 Claims**



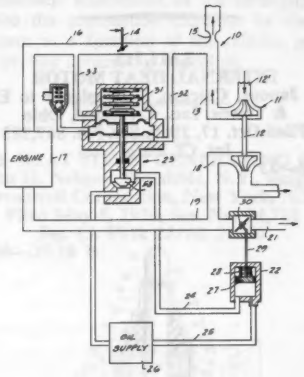
A log chain having similarly shaped hooks at either end contoured for interlocking assembly when shifted bodily while held in predetermined relative positions. The circular opening through each hook is sized to pass freely over the transverse width of the elongated chain links which are so proportioned that the three end links can be used to embrace another portion of the chain to lock it immovably in a fixed choke. Alternatively, the chain passes freely through the hook opening when used to provide a free running choke.

3,611,710
GRAB LINK
Ralph A. Holmes, 11505 NE. Glisan, Portland, Oreg. 97220, and Harold F. Holmes, Box 248, South Coos River, Coos Bay, Oreg. 97420
Filed Oct. 9, 1968, Ser. No. 766,140
Int. Cl. F16g *15/00*
U.S. Cl. 59—93 **1 Claim**



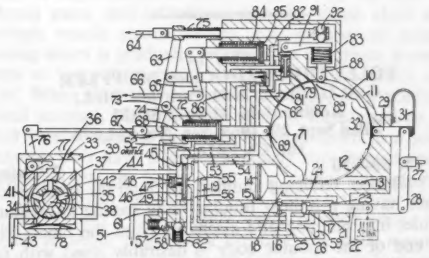
A grab link having a body portion with an opening therein shaped such that one defining wall of the opening forms a widened pulling edge for a strap adapted to be connected to the link. The body portion of the link has a slot leading from the opening arranged to detachably receive a chain link or the like in a grab connection. The grab link is intended to provide a quick connection between a strap-type sling or a load binding strap and a chain.

3,611,711
TURBOCHARGER CONTROL
Milton W. Mueller, Cleveland, Ohio, assignor to TRW Inc., Cleveland, Ohio
Filed Nov. 6, 1969, Ser. No. 874,496
Int. Cl. F02b *37/00*
U.S. Cl. 60—13 **11 Claims**



A control unit which is particularly useful in controlling the output pressure of a turbocharger in response to the manifold pressure with compensation for pressure drop at the throttle characterized by a reference unit disposed in the housing for the manifold pressure to act on and at least one diaphragm extending across said housing to apply the pressure differential between the manifold pressure and the output pressure of the turbocharger. In one embodiment, the reference unit includes a bellows of a predetermined volume of gas which schedules the displacement of the reference unit in response to the temperatures of the gases of the manifold. Another embodiment includes an additional diaphragm and valve means for applying additional pressures to the reference means to compensate for the altitude for the system to prevent overspeeding of the turbocharger.

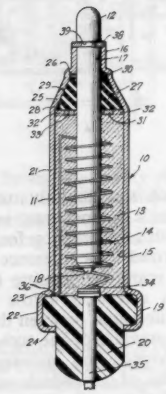
3,611,712
CONTROL SYSTEMS FOR HYDRAULIC TRANSMISSION SYSTEMS
Richard Joseph Ifield, Beecroft, South Wales, Australia, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed Oct. 29, 1969, Ser. No. 872,257
Int. Cl. F16d *31/02*
U.S. Cl. 60—19 **17 Claims**



A control system for a hydraulic transmission system comprising a pump and motor having a common ported

member on which are formed cam surfaces the ported member being angularly movable by means of a servo piston and cylinder device, the cam surfaces controlling devices whereby the control of fluid reaching the piston and cylinder type servo device is achieved in accordance with the angular position of the ported member and thus the speed ratio between the hydraulic pump and motor of the transmission system.

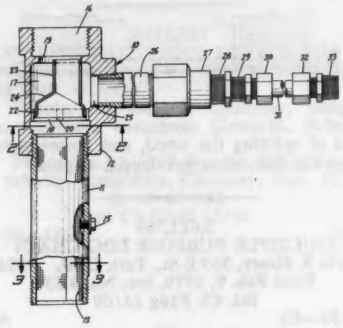
3,611,713
INTERNAL HEAT MOTOR
Donald F. Janous, Chicago, Ill., assignor to Eaton Yale & Towne, Inc., Cleveland, Ohio
Filed Oct. 17, 1969, Ser. No. 867,283
Int. Cl. F03g 7/06
U.S. Cl. 60—23 **11 Claims**



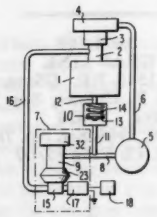
A thermal unit characterized by a piston disposed in a chamber in a housing which contains a temperature sensitive expansive material which expands at a prescribed temperature to cause movement of the piston in the housing. To prevent loss of the thermal material from the housing, a seal ring having a frusto-conical outer surface is disposed in a portion of the housing having a complementary frusto-conical surface so that pressures developed by the expanding material causes the seal ring to wedge into a tighter sealing engagement with a portion of the piston. The sealing arrangement is particularly adapted for use in a thermal motor which includes a heating coil having terminals for receiving an electrical current from a source outside of the unit to cause movement of the piston in response to an application of an electrical current.

3,611,714
POLLUTION REDUCING MUFFLER
Gust H. Bjork, 2601 Parkview Blvd., Robbinsdale, Minn. 55422
Filed Sept. 29, 1969, Ser. No. 861,676
Int. Cl. F01n 3/10
U.S. Cl. 60—30 **7 Claims**

A pollution reducing muffler for internal combustion engines having a hollow tubular body having an exhaust gas inlet into one end and discharge from the other. The inlet end of the tubular body is desirably lined with foraminous material, such as metal screening. A noise reducing muffler may be attached to the discharge end. An aspirator connected to the breather tube of the crankcase of the engine is disposed in series between the gas inlet and discharge. The muffler reduces pollution by promoting further combustion of combustible constituents of the exhaust gases.



3,611,715
DEVICE FOR CONTROLLING A SECONDARY AIR SUPPLY IN AN EXHAUST GAS PURIFYING DEVICE
Yasuo Tatsutomi, Hiroshima, and Tomoo Tadokoro, Kure, Japan, assignors to Toyo Kogyo Company Limited. Hiroshima, Japan
Filed Apr. 20, 1970, Ser. No. 29,970
Claims priority, application Japan, Apr. 18, 1969, 44/36,222
Int. Cl. F01n 3/10; F04b 49/08
U.S. Cl. 60—30 **5 Claims**

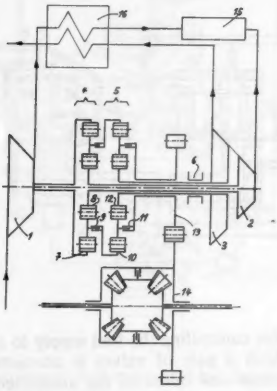


A device for controlling the air supply to an exhaust gas purifying device in which an air pump driven by an internal combustion engine is connected to the exhaust gas purifying device by a first conduit having a check valve means. A second conduit is connected at one end to said first conduit between the check valve means and the air pump and at the other end to the atmosphere and this second conduit has a valve between the second conduit and the atmosphere which acts in response to the engine speed or vehicle speed and thereby controls the secondary air supply to the exhaust gas system in cooperation with the check valve means by providing a by-pass to the check valve. An auxiliary passage is provided in this valve for communicating between the second conduit and the atmosphere, and an auxiliary valve having a larger resilient closing force than that of said check valve closes this auxiliary passage. If the engine speed is such that the valve in the second conduit is closed and the air pressure from the air pump exceeds a predetermined amount, the auxiliary valve is opened against the resilient closing force to hold the pressure in the conduits at the predetermined value.

3,611,716
GAS TURBINE WITH PLANETARY GEARS FOR HIGH OUTPUT IN MOTOR VEHICLES

Riccardo Ferrari, Al Fossato, Giubiasco, Switzerland

Filed June 27, 1969, Ser. No. 837,114
Claims priority, application Switzerland, July 4, 1968, 10,233/68
Int. Cl. F02c 7/02, 7/10, 9/02
U.S. Cl. 60—39.16 C 3 Claims

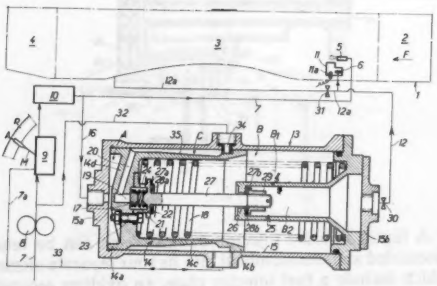


A gas turbine arrangement for motor vehicles in which a compressor is connected to expansion stages through two planetary gears. The planetary gearing is arranged so that the expansion stages rotate in opposite directions relative to the rotational motion of the compressor.

3,611,717
DEVICE FOR PROGRAMMING THE THROUGHPUT OF FUEL SUPPLIED TO A COMBUSTION CHAMBER DURING AN IGNITION OR RE-IGNITION PHASE

Roger Henri Tissier, Paris, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Apr. 23, 1970, Ser. No. 31,190
Claims priority, application France, Apr. 24, 1969, 6913035
Int. Cl. F02c 9/10
U.S. Cl. 60—39.28 10 Claims

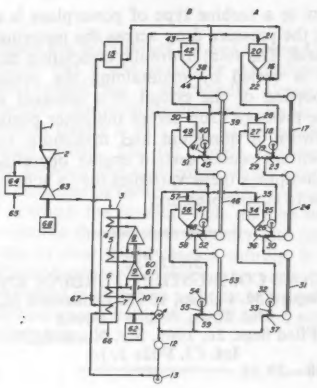


A device for programming the throughput of fuel supplied to a combustion chamber during an ignition or re-ignition phase, the said chamber being of the type in which at least two different fuel-injection systems open into the chamber, namely, a main injection system supplied through a main pipe by a continuously operating main pump, and at least one auxiliary injection system supplied at the time of ignition or re-ignition of the chamber by an auxiliary pump of the piston and cylinder type operating discontinuously and put into operation by the pressure of the fuel being fed to the main injection system, the said device comprising means to provide automatic adjustment of the throughput of fuel injected into the combustion chamber by the main injection system as a function of the relative positions of in, thus providing continuous operation.

3,611,718
WASTE HEAT STEAM GENERATING CYCLE

William H. Nebgen, Woodside, N.Y., assignor to Treadwell Corporation, New York, N.Y.

Filed May 5, 1970, Ser. No. 34,718
Int. Cl. F01k 23/10, 27/00
U.S. Cl. 60—39.18 B 3 Claims



A waste heat power recovery cycle is described which converts to shaft work a larger portion of the heat available from a given source of waste heat than does an ordinary Rankine cycle.

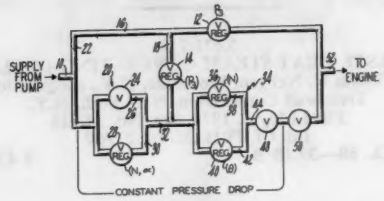
The recovery cycle is particularly illustrated as applied to the waste heat contained in the exhaust gases of a Brayton cycle combustion gas turbine.

The exhause gases, available usually at about 850° F., heat 1500 p.s.i.a. pressurized water to about 596° F. The hot pressurized water is then introduced into one of a plurality of water receivers in which it is permitted to flash at gradually decreasing pressures. The resulting flash steam is superheated to about 800° F. by the 850° F. exhaust gases, and introduced into the steam chest of a multiple nozzle steam turbine. The number of nozzles passing steam is gradually increased as the steam pressure drops so as to keep power production substantially constant. When the steam pressure has dropped a predetermined amount, the unflashed water is transferred to another receiver and is permitted to flash down to a lower pressure. This flash steam is similarly superheated and is introduced into the steam chest of a similar multiple nozzle intermediate pressure turbine. The water is finally introduced into a low pressure water receiver where it is flashed to about condensing pressure, the flash steam is again superheated, and expanded through a multiple nozzle low pressure turbine to the condenser.

The residual water and condensate are then joined, and pumped at high pressure to be heated again by the exhaust

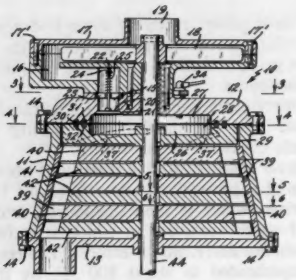
gases as described above. When the pressures of the receivers in the first line drop to the preselected lower pressures, a fresh line of receivers at the higher pressures is cut in, thus providing continuous operation.

3,611,719
FUEL CONTROL
Charles F. Stearns, East Longmeadow, Mass., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed July 12, 1968, Ser. No. 744,395
Int. Cl. F02c 9/08
U.S. Cl. 60—39.28 **13 Claims**



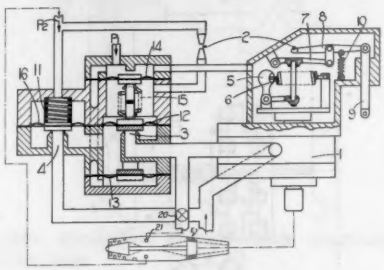
Fuel flow to a turbine type of powerplant is scheduled by varying the pressure drop across the metering valve of a fuel control. The total hydraulic computing circuit pressure drop is varied by maintaining the pressure drop across a portion of the circuit at a constant value and varying the pressure drop across the other portion of the circuit between a minimum and maximum value. The hydraulic circuit senses certain engine operating parameters and computes these variables into a scheduled ratio of fuel flow to engine pressure.

3,611,720
INTERNAL COMBUSTION TURBINE ENGINE
Yngurd M. Fehlau, 154 S. Brunswick St., Old Town, Maine 04468
Filed Sept. 26, 1969, Ser. No. 861,273
Int. Cl. F02c 3/16
U.S. Cl. 60—39.34 **5 Claims**



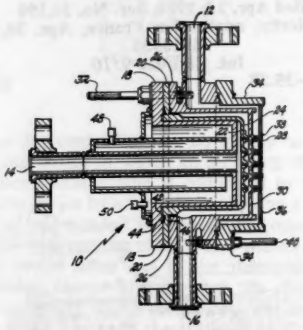
An internal combustion turbine engine or reaction engine having a fixed and a rotary member, each with a relatively large shallow cavity facing the other transversely of a short axis combustion chamber substantially centrally divided transversely of its axis into which a pump supplies air under pressure through a one-way valve and into which fuel is injected and the expanded pressurized fluid is ignited by heat supplied through a plug and the explosive mixture channeled through curved passageways for jet action and against the vanes of alternate turbine and counter wheels to cause the rotary member of the combustion chamber to rotate by the action or driving force of the flow of the products of combustion and to impart rotation to a shaft to which such rotary member is secured.

3,611,721
FUEL CONTROL SYSTEM FOR GAS TURBINE ENGINES
Richard J. Ifield, Beecroft, New South Wales, Australia, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed June 17, 1969, Ser. No. 833,918
Claims priority, application Great Britain, June 24, 1968, 29,923/68
Int. Cl. F02c 9/10
U.S. Cl. 60—39.28 **11 Claims**



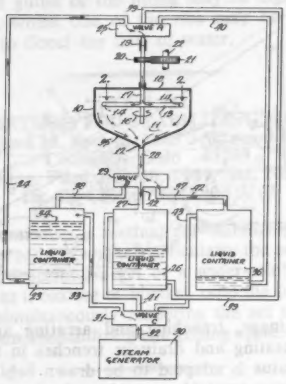
A system for controlling the fuel supply to a gas turbine engine in which a pair of valves is connected in series between the inlet and outlet of the associated fuel pump defining a pressure control device actuable by compressed air so as to spill fuel delivered by the pump to regulate the pressure at which fuel is supplied to the burners in accordance with the pressure of air derived from the compressor.

3,611,722
LIQUID FLUORINE INJECTOR DESIGN
William G. Shick, Lake Park, Fla., assignor to the United States of America as represented by the Secretary of the Air Force
Filed May 10, 1967, Ser. No. 638,700
Int. Cl. F02g 1/00
U.S. Cl. 60—39.74 A **3 Claims**



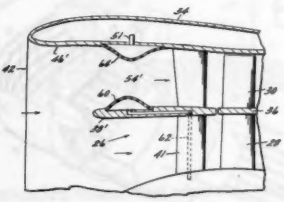
A liquid fluorine injector design which can be readily assembled and disassembled into its four separate elements which include a fuel injector plate, an oxidizer secondary injector spudplate, an oxidizer primary injector spudplate, and an injector backplate. The four separate elements are concentrically positioned so that fuel and oxidizer are injected in a highly efficient manner while still providing for easy disassembly to allow visual inspection of all surfaces exposed to the oxidizer material.

3,611,723
HYDRAULIC TURBINE AND METHOD
James V. Theis, Jr., Park Forest, Ill., assignor to Hollymatic Corporation
Filed Nov. 13, 1969, Ser. No. 876,525
Int. Cl. F03b 1/04
U.S. Cl. 60—51 6 Claims



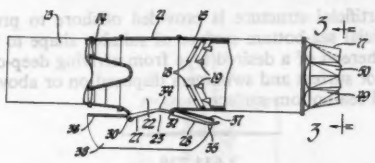
A steam powered hydraulic turbine having closed circuits for the steam system and for the hydraulic liquid system in which the turbine includes a liquid receiving chamber having a drain, a reaction rotor in the chamber rotatable about an axis when propelled by a liquid emitting nozzle on the rotor, a first liquid container having a liquid outlet conduit to the rotor for providing liquid under pressure thereto, a second liquid container having a liquid entrance conduit from the chamber drain for receiving liquid emitted by the rotor nozzle, a source of steam and a steam conduit from the source to the first liquid container above the liquid level therein to apply steam pressure to the first container liquid to force it to and through the nozzle thereby to develop a torque in the rotor. A method of generating power with a steam operated hydraulic turbine.

3,611,724
CHOKED INLET NOISE SUPPRESSION DEVICE FOR A TURBOFAN ENGINE
John T. Kutney, Cincinnati, Ohio, assignor to General Electric Company
Filed Jan. 7, 1970, Ser. No. 1,223
Int. Cl. F02k 3/04; F02c 7/04
U.S. Cl. 60—226 R 11 Claims



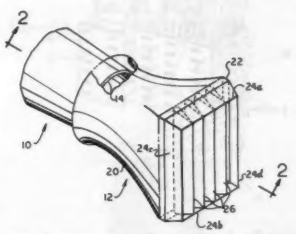
Sound suppression means for a gas turbine power plant which includes a fan positioned within a bypass duct surrounding a core engine for driving said fan. An inflatable diaphragm is positioned within an inlet opening of the casing which surrounds the fan such that choked flow can be obtained near the inlet end of said casing upon inflation of the inflatable diaphragm. The inflatable diaphragm cooperates with axially extending platform members of a plurality of stator vanes located in front of the fan rotor to form a converging-diverging passageway upon inflation of the expansible diaphragm. Choked flow in the inlet substantially eliminates propagation of noise emanating from the fan rotor.

3,611,725
LIFT-CRUISE JET ENGINE
Frederick R. Short, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 17, 1969, Ser. No. 817,625
Int. Cl. F02k 1/00
U.S. Cl. 60—229 1 Claim



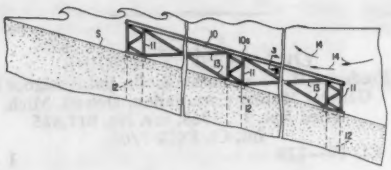
A jet engine for both direct lift and forward propulsion of an aircraft has a gas generator discharging into an exhaust duct which has a rearwardly directed variable area nozzle and a downwardly directed variable lift nozzle. The propulsion nozzle is of a type which can be substantially entirely closed. The lift nozzle includes movable vanes at its forward and rear edges which may be swung to vary the direction of thrust from partly forward to rearward and in which the forward vane may be swung rearwardly to throttle the outlet, and finally into contact with the rear vane to close the lift nozzle entirely. In transition between lift and cruise conditions, the areas of the two nozzles are varied inversely so as to maintain substantially constant turbine speed and back pressure and substantially constant total thrust.

3,611,726
THRUST AUGMENTING AND SOUND SUPPRESSING APPARATUS FOR A JET ENGINE
George E. Medawar, San Diego, Calif., assignor to Rohr Corporation, San Diego, Calif.
Filed Sept. 29, 1969, Ser. No. 861,850
Int. Cl. F02k 1/02, 3/02
U.S. Cl. 60—264 3 Claims



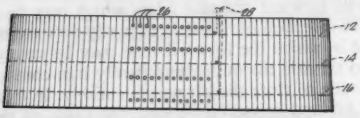
Thrust gas of jet engine is discharged from frustoconical nozzle. Cylindrical forward end of tubular ejector is concentrically spaced around end of nozzle so that slipstream air flowing past the latter enters ejector in annular stream surrounding thrust gas issuing from nozzle. The aft end of the ejector is rectangular and has vanes mounted therein, the long sides of said aft end extending vertically.

3,611,727
WAVE-FORMING STRUCTURE
Robert R. Blandford, 1809 Paul Spring Road, Alexandria, Va. 22307
Filed Feb. 26, 1970, Ser. No. 14,291
Int. Cl. E02b 3/02
U.S. Cl. 61—1 10 Claims



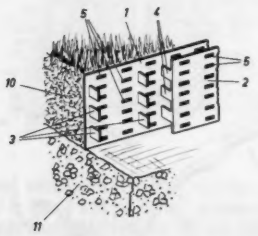
An artificial structure is provided offshore to provide an artificial sea-bottom surface of suitable shape to form waves thereon of a desired type from arriving deep-ocean waves for surfers and swimmers disposed on or above the artificial sea-bottom surface.

3,611,728
STRUCTURE FOR CONFINING AND STORING FLOATING LIQUID PRODUCTS
Gustaaf Van't Hof, 10021 Lesterford Ave., Downey, Calif. 90240
Filed June 2, 1969, Ser. No. 829,303
Int. Cl. E02b 15/04
U.S. Cl. 61—1 F 7 Claims



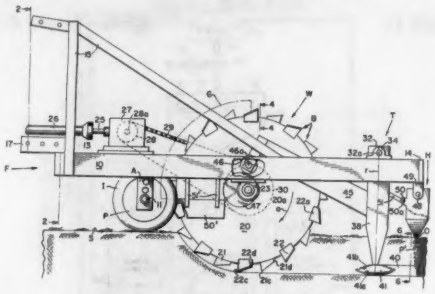
A flexible enclosure formed from a plurality of buoyant vertical members joined side-by-side in a substantially liquid-tight relationship for containing and storing a liquid which floats upon the surface of another liquid.

3,611,729
DRAINED ATHLETIC FIELD
Erwin Stark, Fischerfeldstrasse 28, Linz, Austria
Filed June 4, 1969, Ser. No. 830,409
Int. Cl. E02b 11/00; E01c 11/22
U.S. Cl. 61—10 4 Claims



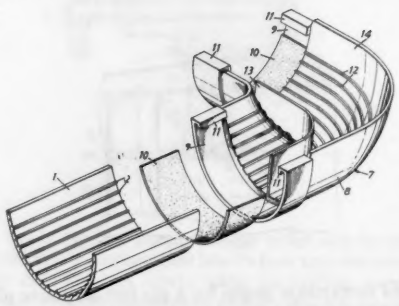
A substantially horizontal, compacted top soil layer overlies a substantially horizontal drainage layer and is sufficiently firm to be walked upon and formed with slots which extend through said top soil layer. A drainage device is placed in each slot, each device having two opposite side walls, an open top end and an open bottom end communicating with said drainage layer. Spacing means between the side walls maintain said side walls spaced apart while defining a drainage passage from said top end to said bottom end of said device.

3,611,730
SOIL DRAINAGE TRENCHING AND AERATING APPARATUS
Henry Joseph Brettrager, 5410 East St., Saginaw, Mich. 48601
Filed Dec. 11, 1969, Ser. No. 884,069
Int. Cl. E02b 11/02; E02f 5/12
U.S. Cl. 61—11 18 Claims



Soil drainage, trenching and aerating apparatus for forming aerating and drainage trenches in turfed fields. The apparatus is adapted to be drawn behind a tractor and includes a rotatable trenching wheel mounting a plurality of oppositely pitched and circumferentially spaced soil removing blades for removing subsoil to form a trench of a predetermined width. A torpedo-shaped trench widening device follows in the path of the trenching wheel for widening a portion of the trench adjacent the bottom thereof by compacting the soil therearound. A pivotally mounted hopper, carrying trench-filling pelletized material, is also provided for filling the trench with randomly arranged pelletized material which permits the surface water to flow between the interstices of the pelletized material to the widened portion of the trench. Cam apparatus, operatively connected with the trenching wheel, is provided to agitate the trench widening device and simultaneously agitate the hopper to shake the pelletized material from the hopper into the trench.

3,611,731
GUTTERS AND GUTTER FITTINGS
Ronald Edmondson, Chislehurst, Kent, England, assignor to Plastiers Limited, London, England
Continuation of application Ser. No. 771,813, Oct. 30, 1968. This application Dec. 27, 1968, Ser. No. 787,432
Int. Cl. E02b 9/04
U.S. Cl. 61—14 2 Claims



This invention relates to gutters for rainwater and like uses and to fittings for such gutters. According to the invention a gutter of the open-trough type is made of a synthetic plastics material so that it has a number of

spaced integral, inwardly projecting ribs which extend in the direction of flow. Preferably the sides and bottom of the gutter form a continuous curve with each other. In the case of a fitting to which such a gutter is to be fitted, for example to connect one gutter to another or to a downpipe, the fitting itself is formed with internal ribs which are intended to form continuations of the gutter ribs when the parts are fitted together. One outer wall of a curved gutter or the fitting may be higher than the inner wall, whilst one of the ribs may be higher than the others to direct the flow of water.

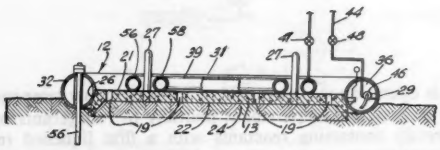
3,611,732
METHOD FOR STABILIZING SILT
Michael M. Epstein, 2885 Scottwood Road, Columbus, Ohio 43209
No Drawing. Filed July 30, 1969, Ser. No. 846,243
Int. Cl. C09k *3/08*; E02d *3/12*
U.S. Cl. 61—36 **9 Claims**

This invention is a method for stabilizing silt in the bottom of a body of water, particularly the oceans, which consists of depositing a gel of a water-soluble polymer, preferably as a coating or blanket, onto the surface of the silt while simultaneously rendering the gel water insoluble as with an insolubilizing and gelling agent.

3,611,733
METHOD OF SEALING OPENINGS
Louis H. Eilers, Inola, and Christ F. Parks, Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Continuation-in-part of application Ser. No. 563,679, July 8, 1966, This application Oct. 6, 1969, Ser. No. 864,228
Int. Cl. C09j *3/04, 3/06*; E02d *3/12*
U.S. Cl. 61—36 R **8 Claims**

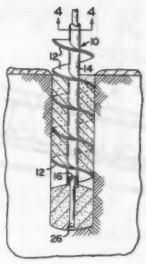
An improved method of sealing off an opening, either temporarily or more-or-less permanently, to inhibit the passage of aqueous fluids which comprises emplacing in the opening a fluid aqueous salt-natural polymer composition which indigenously sets to a fluid-tight resilient solid having predetermined longevity dependent upon the pH value of the fluid composition.

3,611,734
FOUNDATION ANCHOR FOR FLOATING MARINE PLATFORM
George E. Mott, Metairie, La., assignor to Texaco Inc., New York, N.Y.
Filed Feb. 17, 1970, Ser. No. 11,998
Int. Cl. B63b *35/44*
U.S. Cl. 61—46.5 **12 Claims**



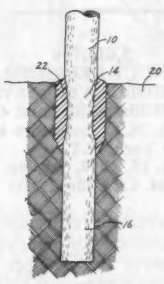
The invention relates to a separable component foundation anchor adapted for positioning an offshore floating platform or other floatable vessel at a desired deep water well drilling site. The anchor includes a relatively heavy pilot member and a submergible casing or ballast section. The anchor further includes means to engage the lower end of the offshore platform to minimize movement of the latter at the water's surface. The ballast section cooperates with the pilot member, functioning sequentially as a transport means to the offshore site, and after being ballasted and submerged supplements the weighted pilot section. Said ballast section further may hold a quantity of fluids used in an oil drilling or producing operation such as drilling mud, crude oil and the like whereby to minimize the need for additional platform space to store such materials.

3,611,735
METHOD OF MAKING CONCRETE BODIES
Donald S. Daczko, Bedford, Ohio (Construction Techniques, Inc., 1700 Superior Bldg., Cleveland, Ohio 44114)
Filed Oct. 24, 1968, Ser. No. 770,167
Int. Cl. E02d *5/38*; E04b *1/16*
U.S. Cl. 61—53.64 **16 Claims**



A concrete body is formed with a perforate tube or tubes encased in a filter sleeve immersed in the concrete. The tube may be installed by inserting it into the hollow shaft of an auger and injecting grout through the shaft while the auger is withdrawn thereby leaving the tube embedded in the grout. Alternatively, the tube may be inserted directly into freshly placed concrete or may be set in an open hole or casing or form prior to placement of the concrete or grout. With either method, the tube forms a hollow core by which excess water may be removed to improve the quality of the concrete. Also, the core may be used for inserting a vibratory source, testing equipment, installing reinforcing members, or other useful purposes.

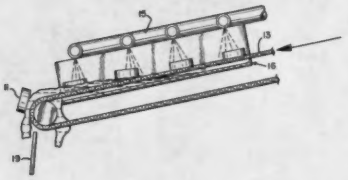
3,611,736
METHOD OF PROTECTING AND RESETTING POLES IMBEDDED IN SOIL
Jack P. Goodman, 2500 S. Tejon, Englewood, Colo. 80110
Filed Jan. 26, 1970, Ser. No. 5,529
Int. Cl. E02d *5/60*
U.S. Cl. 61—54 **2 Claims**



A method of protecting poles imbedded in soil includes excavating the ground around an existing set pole a short

distance from the pole and to a depth to uncover the pole from ground-line to a point below the deterioration area, cleaning the excavated portion of the pole, partially filling the excavated pole with a mixture of a synthetic resin and a blowing agent, permitting the ingredients to react to form a foamed resin and then permitting the resin to set, thereby sealing the excavated area of the pole and completely filling the excavation.

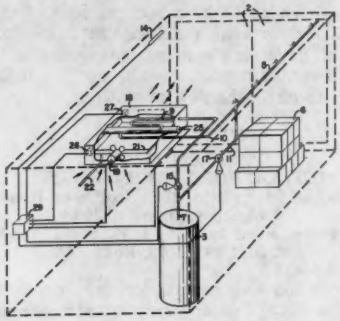
3,611,737
FREEZING OF FRAGILE FOODSTUFFS WITH AN EBULLIENT LIQUID FREEZANT
Raymond D. Alaburda and Vincent H. Waldin, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 12, 1969, Ser. No. 806,599
Int. Cl. F25d *3/10*
U.S. Cl. 62—63 **12 Claims**



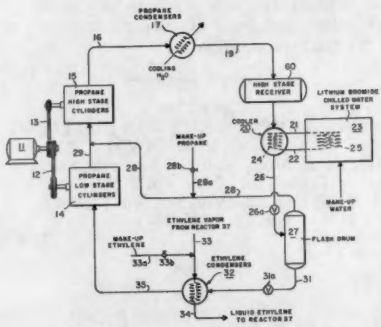
A process and apparatus for freezing fragile, generally flat, naturally occurring or prepared, food products by direct contact with an ebullient, liquid, polyfluorinated halohydrocarbon freezant having a normal atmospheric boiling point of about −5° C. to −50° C. and a vapor density at its boiling point at least about twice that of air at the same temperature, said freezing process including the steps of, and said freezing apparatus including means for, flooding or spraying the upper surfaces of individual pieces of the fragile food products with liquid freezant at low velocity as they are being transported by a foraminous conveyor to form a stable frozen crust on the upper surfaces, collecting the flooding or spraying freezant in a collecting means of suitable dimensions and positioned immediately below a portion of the conveyor which is in contact with the pieces, lifting the pieces from the conveyor and contacting the lower surfaces thereof with freezant by maintaining the level of freezant in the collecting means above the top surface of the conveyor, continuing the contacting of the lower surfaces of the pieces with freezant to form a stable frozen crust on the lower surfaces, and completing the freezing of the pieces by further direct contact with ebullient liquid freezant.

3,611,738
FROZEN PRODUCT REFRIGERATION AND DEHUMIDIFICATION SYSTEM
David P. Maurer, Williamsville, and Gerard F. Hagenbach, Tonawanda, N.Y., assignors to Union Carbide Corporation, New York, N.Y.
Filed Apr. 15, 1970, Ser. No. 28,662
Int. Cl. F25d *25/00*
U.S. Cl. 62—64 **10 Claims**

A mobile storage chamber refrigeration and dehumidification system and method for removing moisture from the chamber atmosphere and chamber and storage product surfaces employing a pressurized liquefied refrigerant gas which is vaporized within a heat exchanger located within the mobile chamber and dispensed thereafter through overhead spray conduit means. A fan passes the chamber moisture-laden atmosphere over said heat exchanger causing frost to build up on same while dehumidifying such circulated chamber atmosphere. Such frost is periodically melted and removed from said mobile chamber, while refrigeration is maintained within such chamber by means of a bypass conduit which provides for refrigerant flow from its storage container to said overhead spray conduit without passing through said heat exchanger.

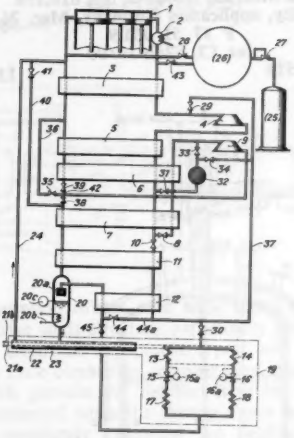


3,611,739
REFRIGERATION METHOD
Joseph M. Bonem, Baytown, Tex., assignor to Esso Research and Engineering Company
Filed June 3, 1969, Ser. No. 830,018
Int. Cl. F25b *7/00*
U.S. Cl. 62—79 **4 Claims**



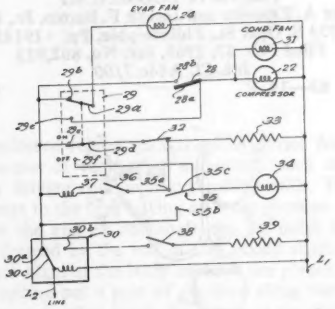
An operation is maintained at a selected low temperature in a system employing a plurality of refrigerants by indirectly contacting reactants with a first liquefied refrigerant to remove heat from said operation by vaporization of the first refrigerant, the resulting vapors being removed and condensed for reuse by indirect contact with a chilled second refrigerant having a boiling point higher than the first refrigerant; the second refrigerant is compressed, cooled and chilled, the chilling being accomplished by indirect contact with a chilled liquid having a boiling point greater than that of the second refrigerant. The compressed and chilled second refrigerant is flashed to reduce its temperature further and is then employed to indirectly contact the first refrigerant to condense it for reuse in said operation.

3,611,740
PROCESS FOR COOLING A CONSUMER CONSISTING OF A PARTLY STABILIZED SUPERCONDUCTIVE MAGNET
Urs Giger, Abtwil, Saint Gall, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland
Filed Dec. 11, 1969, Ser. No. 884,175
Claims priority, application Switzerland, Dec. 19, 1968, 18,955/68
Int. Cl. F25b *7/00*
U.S. Cl. 62—79 5 Claims



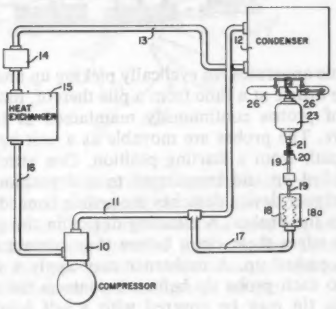
The partly stabilized superconductive magnet is cooled by separating the helium stream into two part-flows. One part flow is throttled, heated, expanded while doing work, and then directed back into the circuit downstream of the consumer. The other part-flow is throttled to a pressure above critical, cooled, directed through a hollow conductor forming the magnet while throttling the flow and then further throttled in a valve to form a gas and liquid mixture, heated and then returned to the compressor.

3,611,741
ICE MAKER REFRIGERATION CONTROL
William J. Linstromberg, Evansville, Ind., assignor to Whirlpool Corporation
Filed Oct. 31, 1969, Ser. No. 872,857
Int. Cl. F25c *1/00*
U.S. Cl. 62—137 6 Claims



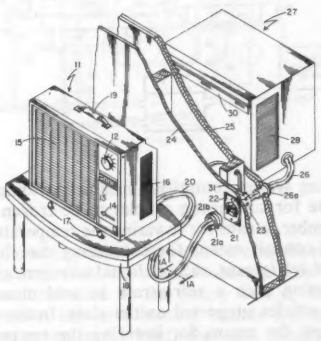
A control for providing improved operation of a refrigeration apparatus whereby effective maximum efficiency in the operation of an ice maker associated with the refrigeration apparatus is obtained. The control effects a continuous directing of refrigerated air against the ice maker apparatus whenever the ice body collecting means is less than full thereby permitting the ice maker to rapidly produce ice bodies for bringing the collecting means to a full condition.

3,611,742
AUTOMATICALLY ADJUSTABLE CONDENSER COOLING APPARATUS
Howard E. Douglas, 1396 Barbara Drive, Santa Clara, Calif. 95050
Filed July 20, 1970, Ser. No. 56,452
Int. Cl. F25b *39/04*
U.S. Cl. 62—183 4 Claims



A low ambient temperature control for air cooled condensers utilizing a motor driven fan and a control which rapidly responds to the condenser pressure to adjust the pitch of the fan blades thereby providing a very reliable control of the condenser cooling.

3,611,743
ROOM AIR CONDITIONER
Anthony J. Manganaro, 6 Bassett Ave., Burlington, Mass. 01803
Filed Nov. 19, 1969, Ser. No. 877,965
Int. Cl. F25d *23/12*
U.S. Cl. 62—263 7 Claims

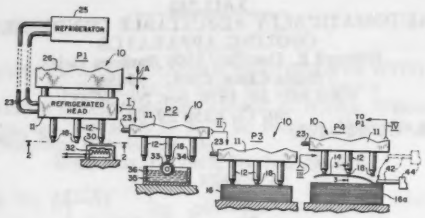


A room air conditioner is described which can be positioned anywhere in a room, does not require a window and is much quieter than conventional units. It comprises separate interior and exterior assemblies, with the interior assembly containing the evaporator and the exterior assembly the condenser and compressor. Flexible conduits, preferably detachable, are used to interconnect the refrigerant lines between the interior and exterior assemblies.

3,611,744
CRYOGENIC PICKUP

Richard K. Sutz, Riverdale, N.Y. (% International Symbiotics, Inc., 733 Yonkers Ave., Yonkers, N.Y. 10704)

Filed May 11, 1970, Ser. No. 36,212
Int. Cl. B65h 3/00
U.S. Cl. 62—303 10 Claims

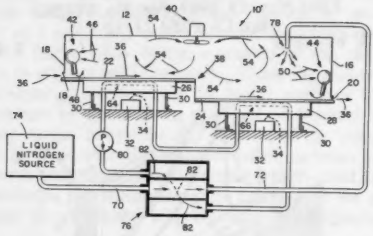


Cryogenic apparatus for cyclically picking up and transferring one article at a time from a pile thereof, includes a plurality of probes continuously maintained at freezing temperature. The probes are movable as a unit by a carrier in a path from a starting position. One article at a time is picked up and transferred to a deposition point where a stripper device detaches the article bonded by ice matrices to the probes. A cleaning device in the path of the probes wipes them clean before they contact the article to be picked up. A moistener may apply a film of moisture to each probe tip before it contacts the article. Each probe tip may be covered with a self lubricating layer to facilitate detachment of the article. A vaporizer for humidifying the articles may be provided.

3,611,745
FREEZING SYSTEM

Alfred H. Schlemmer, Indianapolis, Ind., assignor to Ralph Hamill, Indianapolis, Ind.

Filed Nov. 24, 1969, Ser. No. 879,176
Int. Cl. F25d 17/00
U.S. Cl. 62—333 12 Claims

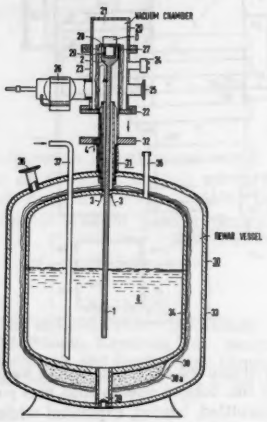


A freezing system comprising means providing a chamber, a plate for supporting articles to be frozen disposed in the chamber, means for lowering the temperature of the plate, first conduit means for connecting the chamber to a source of refrigerant, such as liquid nitrogen, and means for circulating such a refrigerant in said chamber and about the articles supported on the plate. In the preferred embodiment, the means for lowering the temperature of the plate includes a closed-circuit refrigeration system having passageways disposed in heat-conducting relationship to the plate and additional passageways, and a heat exchanger disposed in heat-conducting relationship to the said additional passageways. The heat exchanger is provided with an input port and an exit port, and the said first conduit means includes means for connecting the input port to such a refrigerant source and the exit port to the chamber, whereby the refrigerant to be exhausted into the chamber is first circulated through the heat exchanger in heat-conducting relationship to the said additional passageways of the closed circuit refrigeration system.

3,611,746
CRYOSTAT FOR COOLING VACUUM-HOUSED RADIATION DETECTOR

Helmut Marsing and Gerhard Weidmann, Neunkirchen, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Mar. 25, 1969, Ser. No. 810,198
Claims priority, application Germany, Mar. 26, 1968, P 17 51 051.9
Int. Cl. F25b 19/00
U.S. Cl. 62—514 13 Claims

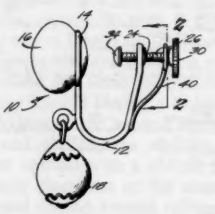


A loosely assembled cryostat of modular construction comprises a Dewar vessel having a reservoir of liquid gas refrigerant. A vacuum chamber is coupled to the Dewar vessel via a refrigerant transfer device and cooled by refrigerant from the reservoir. The vacuum chamber has a refrigerated surface for mounting a radiation detector to be cooled and electrical and evacuating couplings for independent evacuation of the vacuum chamber. The Dewar vessel has a nozzle opening into the area of the reservoir and the refrigerant transfer device includes the nozzle, which is in operative proximity with the refrigerated surface of the vacuum chamber.

3,611,747
SCREW EARRING CLAMP WITH SPRING TO PREVENT LOOSENING

Salvatore A. Esposito and Joseph F. Batten, Jr., both of 2033 S. Opal St., Philadelphia, Pa. 19145

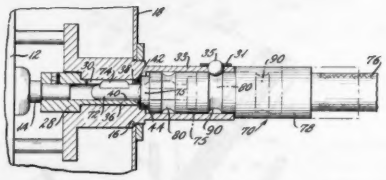
Filed Feb. 27, 1969, Ser. No. 802,913
Int. Cl. A44c 7/00
U.S. Cl. 63—14 E 1 Claim



A screw type earring clamp providing improved grip wherein a thumb screw is tightened to move toward the ear lobe flange to push against the ear lobe and, in turn,

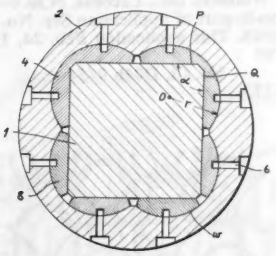
the ear lobe contacts the post of the earring clamp which, in turn, holds the earring to the ear lobe. The device is of simple construction and provides ease of adjustment for applying differential pressure with respect to the threaded support member of the earring clamp.

3,611,748
QUICK CONNECT FLEXIBLE DRIVE
Linus E. Wallgren, Rockville, Md., assignor to Pace, Incorporated, Silver Spring, Md.
Filed May 28, 1970, Ser. No. 41,187
Int. Cl. F16d 3/06
U.S. Cl. 64—4 **3 Claims**



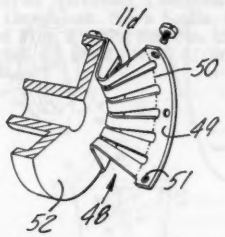
The invention relates to a male ended quick convert flexible drive shaft structure particularly adapted for use with an electronic equipment repair and maintenance unit. The male connection member is of special construction which permits the flexible drive to be connected and disconnected while the driving motor is in operation without completely removing the flexible drive shaft structure from the motor.

3,611,749
COUPLING
Józef Kasperczyk and Henryk Sidlo, Chorzow, Poland, assignors to Huta Zygmunt Przedsiebiorstwo Panstwowe, Lagiewniki, Poland
Filed Sept. 4, 1969, Ser. No. 855,313
Claims priority, application Poland, Sept. 14, 1968, P 129,056
Int. Cl. F16d 3/16
U.S. Cl. 64—8 **2 Claims**



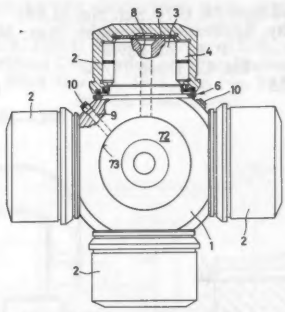
The disclosure relates to a coupling device for transmitting torque of very great magnitude such as is required for driving rolls in heavy rolling mills. The coupling belongs to the type having an inner member (plug), formed by the end of one shaft and an outer member (socket), formed by the end of the second shaft. At the longitudinal edges of the inner member are placed inserts, made by cutting out a part of a sphere along two planes intersecting each other inside the sphere at an angle equal to the angle formed by the lateral faces of the inner member. The inserts with their spherical surfaces are located in concave internal recesses made in the outer member. The geometrical centers of the spherical surfaces lie on the bisectors of the angles. The coupling enables some longitudinal movement as well as some rocking movement of the shafts.

3,611,750
FLEXIBLE TORSIONALLY-RESILIENT COUPLING
Joseph Gasior, Bloomfield, N.J., assignor to Midland-Ross Corporation
Filed Oct. 23, 1969, Ser. No. 868,798
Int. Cl. F16d 3/66
U.S. Cl. 64—15 **3 Claims**



A coupling comprising angularly-spaced U-shaped strap-like spring elements in rigid connection with supporting hub or flange members of a coupling and capable of accommodating parallel and angular misalignment, adjusting to axial relative movement of opposed shafts, and cushioning sudden changes of torque.

3,611,751
UNIVERSAL JOINT SPIDER
Hans-Joachim Kleinschmidt, Essen, Germany, assignor to Gelenkwellenbau G.m.b.H., Essen, Germany
Filed Sept. 30, 1969, Ser. No. 862,268
Claims priority, application Germany, Sept. 30, 1969, G 67 51 246
Int. Cl. F16d 3/26
U.S. Cl. 64—17 **3 Claims**

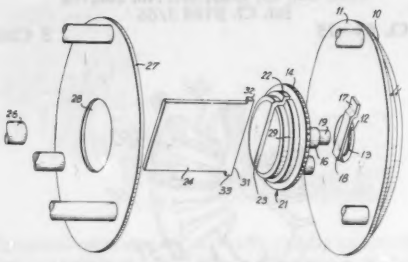


Universal joint spider includes a core member, a plurality of journal pins extending from the core member in directions transverse to the rotary axis of the spider and received in respective bearing bushes insertable into the forks of a universal joint, the core member being formed with a recess serving as a lubricant chamber and communicating through respective lubricating ducts with a bearing chamber located between and defined by each of the journal pins and the respective bearing bush, and at least one closure member sealing the recess and comprising a cover portion covering the open end of the recess and a nose portion extending coaxially with the rotary axis of the spider from the cover portion to the inner closed end of the recess.

3,611,752
SHAFT COUPLING

Frank W. Perazzella, Wolcott, Conn., assignor to North American Philips Corporation, New York, N.Y.

Filed Feb. 27, 1970, Ser. No. 15,038
Int. Cl. F16d 3/04
U.S. Cl. 64—7 3 Claims

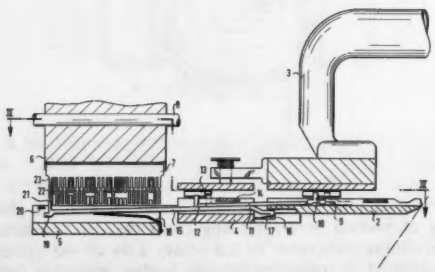


A shaft coupling to transmit rotation from one shaft to another not necessarily co-linear therewith. The coupling comprises a blade mounted on one of the shafts and extending axially from the one shaft toward the other, one end of the blade having limited freedom of movement back anf forth in one direction transverse to the other shaft. The blade is captured in the one shaft by a groove which is wider than the blade, thereby allowing the free end of the blade limited freedom of movement. The captured end of the blade is substantially T-shaped to aid in its entrapment by other components of the assembled device.

3,611,753
PATTERN CONTROL MECHANISM FOR A FLAT-BED KNITTING MACHINE

Erich Krause, Bopfingen, Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany

Filed Apr. 24, 1970, Ser. No. 31,671
Claims priority, application Germany, Apr. 30, 1969, P 19 22 289.0
Int. Cl. D04b 15/70
U.S. Cl. 66—75 6 Claims

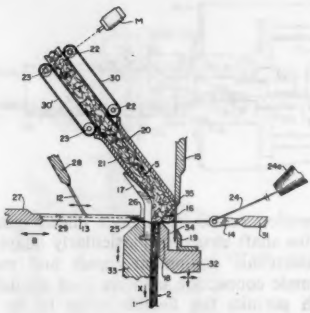


Butts on pattern jacks under knitting needles in a flat-bed knitting machine are engaged by cams on the machine carriage for lifting the knitting needles to two levels depending on the extent to which the jack butts project from the needle bed and for thereby presenting the needles to needle cams on the carriage. The jacks are moved transversely by tilting fingers operated by control arms on the carriage which engage butts on the fingers and are backed by projections on pattern plates circumferentially distributed on a pattern drum on the carriage. The drum may be indexed during each reversal of carriage movement for changing the positions of the control arms.

3,611,754
TEXTILE MATERIAL AND MANUFACTURE

Engelbert Ehrlich, Floha, Saxonia, and Martin Schonfuss, Hohenstein-Erlangen, Germany, assignors to VEB Nahwirkmaschinenbau Malimo Karl-Marx-Stadt, Karl-Marx-Stadt, Germany

Filed June 2, 1969, Ser. No. 829,363
Int. Cl. D04b 23/10
U.S. Cl. 66—84 8 Claims



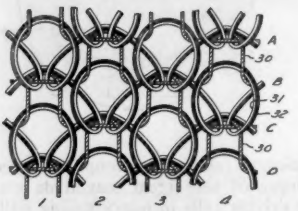
A run-resistant textile material includes a knitted structure of warp threads on a backing layer of loose fibrous material.

Individual fibers are pulled out of the layer by notched knitting needles of a warp knitting machine and formed into loops together with, and underlying the chain switched warp threads. The fiber loops whose ends are anchored in the backing layer protect the fabric from laddering when a single stitch is broken.

3,611,755
RUN RESISTANT STOCKING TAB

John J. Millar, Laconia, N.H., assignor to Scott & Williams, Inc., Laconia, N.H.

Continuation-in-part of application Ser. No. 765,821, Oct. 8, 1968. This application Feb. 24, 1970, Ser. No. 13,700
Int. Cl. D04b 9/54
U.S. Cl. 66—173 9 Claims



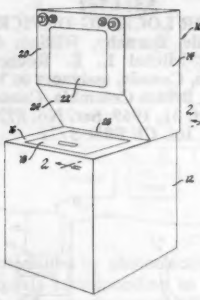
Fine-gauge, circularly knit seamless stocking has a tab portion of fabric formed after a transfer operation and which represents a terminal portion of knitting. Raveling or runs in the tab portion are prevented by having courses in the tab including a polyamide yarn having a much lower melting point than the yarn used in the remainder of the stocking and which fuses or becomes tacky at boarding temperature so that the fusing takes place during this stage of processing.

3,611,756

ARRANGEMENT FOR ATTACHING A CLOTHES DRYER TO THE TOP OF A CLOTHES WASHER

Byron L. Brucken, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed July 8, 1970, Ser. No. 53,088
Int. Cl. D06f *29/00*
U.S. Cl. 68—3 R 5 Claims



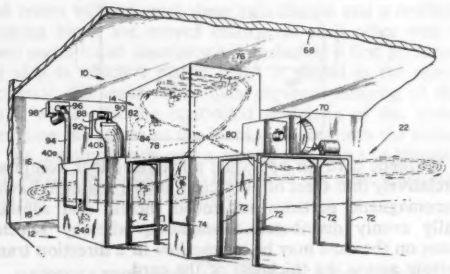
A vertically stacked combination clothes washer and clothes dryer wherein the top of the washer cabinet has a top opening in juxtaposition with a bottom opening on the dryer cabinet. A control support panel provides a partition between the cabinets of the washer and dryer closing the openings, rigidifying the cabinets and providing a mounting panel for components associated with the washer and the dryer. The dryer cabinet overhangs the rear of the washer cabinet to provide a protected utility connection area. A pair of heavy plates sandwich juxtaposed flanges on the washer and dryer cabinets to provide a solid connection of the clothes dryer to the clothes washer.

3,611,757

PLUSH PILE FABRIC RE-ERECTION APPARATUS

Isaac Hills, Roslyn, N.Y. (% My-Toy Co., Inc., 944 3rd Ave., Brooklyn, N.Y. 11232)

Filed Jan. 29, 1970, Ser. No. 6,848
Int. Cl. D06c *29/00*; B08b *3/10, 5/00*
U.S. Cl. 68—5 B 11 Claims



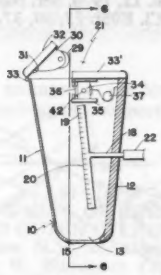
The apparatus includes a conveyor upon which articles having an outer covering of plush pile fabric are placed so that the pile fabric may be cleaned and the pile fibers thereof re-erected to produce a fluffy appearance. The conveyor carries the articles through a jacketed first chamber wherein they are subjected to blasts of steam while being rotated to assure thorough and uniform treatment of the pile fabric. The conveyor track subsequently carries the articles to a second chamber which is elevated with respect to the first chamber, and wherein the articles are dried. A portion of the heated air in the second chamber is directed into the jacket surrounding the first chamber to control the temperature in the first chamber. Subsequently, the conveyor carries the articles to an unloading station wherein they are prepared for packaging.

3,611,758

DIAPER CLEANER

Robert Glen Miller, 1229 18th St. NW., Calgary 42, Alberta, Canada; and Clarence Wayne Houde, 7 Perth Drive; and Ryan Alexander Campbell, 11c Catherine St., both of Dartmouth, Nova Scotia, Canada

Filed Mar. 2, 1970, Ser. No. 15,343
Int. Cl. D06f *11/00, 41/00*
U.S. Cl. 68—22 A 10 Claims



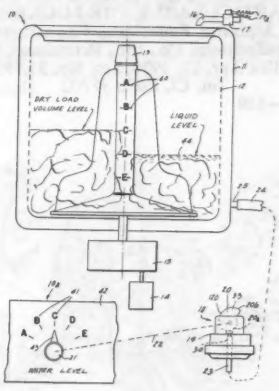
An open based container engages over a toilet bowl and the soiled diaper is placed therein. The lid is closed engaging a fixed roller with the diaper and applying squeezing pressure against a spring loaded roller. A high pressure water spray is directed against the soiled side of the diaper which, after a short rinsing time, is pulled slowly out from between the rollers which wring dry the diaper as it is being pulled through the rollers.

3,611,759

WATER LEVEL CONTROL FOR AUTOMATIC WASHING MACHINE

Donald E. Janke, Benton Harbor, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

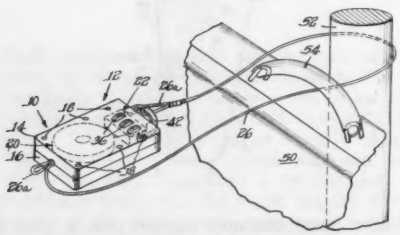
Filed Mar. 18, 1970, Ser. No. 20,552
Int. Cl. D06f *39/08*
U.S. Cl. 68—207 6 Claims



A method of predetermining an optimum water level in an automatic washing machine as a function of the dry volume of a load of material to be laundered. To

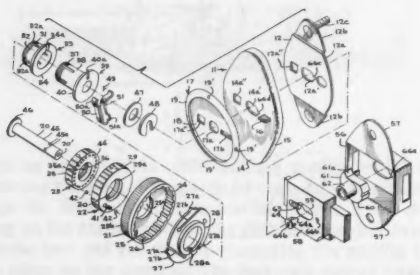
facilitate performing the method, an upright vertical portion of the treatment zone, for example, the agitator of the washing machine, is calibrated to identify known volumetric capacities of the treatment zone. Corresponding indicia at different vertical levels are provided to measure the dry load volume of a batch of material to be laundered. A water level selector switch having indicia correspondingly correlated to the indicated dry load level is then preset to admit into the treatment zone a predetermined quantum of laundry liquid matched to the dry volume of material to be laundered.

3,611,760
LOCKING DEVICE
Richard M. Muther, Winnetka, Ill., assignor to Muther Enterprises Inc., Northfield, Ill.
Filed Jan. 12, 1970, Ser. No. 2,030
Int. Cl. E05b *73/00, 37/02*
U.S. Cl. 70—58 **9 Claims**



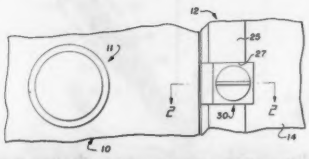
This invention relates generally to locking devices and more particularly to locking devices employing a retractable cable means and a housing therefor of a size which enables it to be held in the hand of the user. The embodiment of the invention disclosed herein comprises a relatively small housing or casing supporting a rotary reel and cable, one end of the cable being connected to the reel and the other free extremity thereof projecting from the housing in position to be gripped by the user. A spiral spring in the housing is biased to effect automatic return of the cable upon the reel. A lock control latch means associated with the housing is adapted for detachable coupling with the free cable extremity.

3,611,761
COMBINATION LOCK CONSTRUCTION, PARTICULARLY FOR LOCKERS
Wallace E. Atkinson, Petersburg, Va., assignor to Long Manufacturing Co., Inc., Petersburg, Va.
Filed Apr. 27, 1970, Ser. No. 31,999
Int. Cl. E05b *37/02*
U.S. Cl. 70—129 **21 Claims**



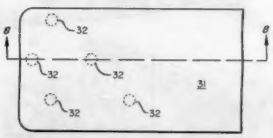
A combination lock assembly for locker doors and the like, wherein a plurality of dial assemblies are located in progressively outwardly spaced relation forwardly of a base plate on the door and control plural tumbler wheel members each having a peripheral gate. The base plate has a fixed fence bar located in horizontal alignment with the axis of rotation of the dial assemblies, with which the peripheral gates are aligned, whereupon the dial assemblies and tumbler wheels can be shifted laterally as a unit to a position retracting a bolt from locking position.

3,611,762
DOOR LOCKING DEVICE
Stuart G. McBurnie, Burnaby, William G. Fortt, Port Coquitlam, and Michel L. E. Rocher, Vancouver, British Columbia, Canada, assignors to Velto Industries Ltd., Vancouver, British Columbia, Canada
Filed Oct. 31, 1969, Ser. No. 872,806
Int. Cl. E05c *3/22*
U.S. Cl. 70—150 **8 Claims**



A device mountable in a door jamb and including a shaft which is rotatable from the interior of the room, and also from the room exterior by means of a key, the shaft having a locking cam on the periphery thereof. A latch bolt is mounted in an edge of the door jamb to engage an adjacent door edge and hold the door closed, the latch bolt normally being released by actuation of a door mounted set. The locking cam engages a part carried by the latch bolt to lock the bolt in engaged position until the shaft is rotated by appropriate turning movement applied to either end of the shaft.

3,611,763
MAGNETICALLY OPERATED MECHANISM AND MAGNETIC CARD
Bruce S. Sedley, Larkspur, Calif., assignor to H. O. Boehme, Inc., Westbury, N.Y., and Burbank, Calif.
Original application Nov. 4, 1966, Ser. No. 592,006, now Patent No. 3,444,711, dated May 20, 1969. Divided and this application July 25, 1968, Ser. No. 763,452
Int. Cl. E05b *19/26, 47/00*
U.S. Cl. 70—413 **2 Claims**

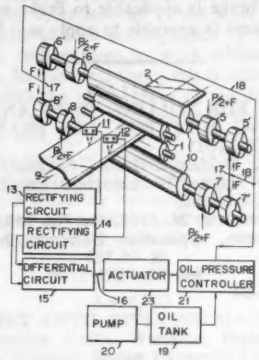


Magnetic card for operating a magnetic lock comprises a relatively thin sheet of plasticized binder material having ferromagnetic particles suspended therein and substantially evenly distributed throughout, whereby selected areas on the card may be magnetized in a direction transversely across the thickness of the card.

3,611,764
METHOD AND APPARATUS FOR CONTROLLING ROLLING MILLS
Kunji Asano, Kawasaki-shi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed July 15, 1969, Ser. No. 841,755
Int. Cl. B21b *37/00*
U.S. Cl. 72—8 **10 Claims**

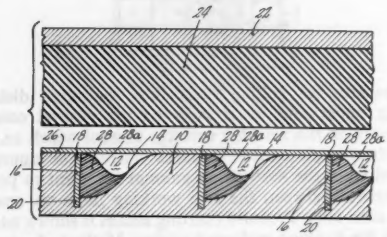
In a method and apparatus for controlling a rolling mill wherein a crown controller is used to control the

crown of the mill rolls and the controller is operated in accordance with the surface contour of the strip, the surface contours at the central portion and edge portion



of the strip are measured by photoelectric means to obtain differentiated signals corresponding to respective surface contours and the difference between differentiated signal is utilised to operate the crown controller.

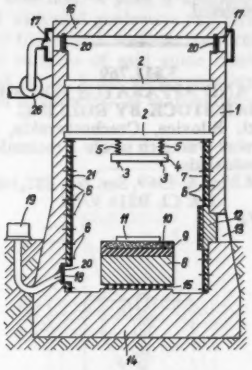
3,611,765
METHOD OF FORMING LOUVERS
John William Harvey, Milford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Sept. 8, 1969, Ser. No. 855,876
Int. Cl. B21d *28/18*
U.S. Cl. 72—55 **4 Claims**



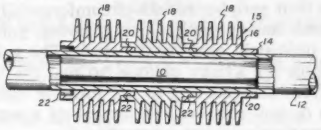
A two-step method is provided for producing louvers by the Guerin process in which a form block having a closed-end recess with an erect shear rule therein and a resilient forming block are moved relative to each other with a sheet metal blank therebetween, including a first preforming step in which a plastic insert is placed in the recess alongside the shear rule which prevents shearing of the blank while effecting controlled stretching of the metal overlying the recess as the blank is forced into the recess by the forming block, and a second shearing and forming step performed in the same manner in the same apparatus with the plastic insert removed.

3,611,766
DETONATION CHAMBER FOR EXPLOSIVE WORKING OF METALS
Winfried Klein, Essen, and Hans-Friedrich Wilms, Oberhausen, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Jan. 21, 1969, Ser. No. 792,315
Claims priority, application Germany, Jan. 20, 1968, P 16 52 627.5; Sept. 14, 1968, P 17 77 168.5
Int. Cl. B21d *26/08*
U.S. Cl. 72—56 **25 Claims**

A detonation chamber for explosive working of metals, which includes: a substantially cylindrical hollow body with its longitudinal axis extending substantially vertically, foundation means supporting said hollow body, and cushioned table means arranged in the lower portion of said hollow body for receiving and supporting the means to be explosive worked.

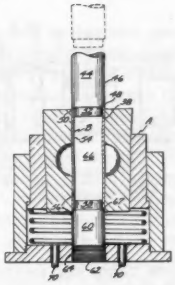


3,611,767
EXPLOSIVE FORMING OF INNER CYLINDERS INTO OUTER CYLINDERS
Irwin Berman, Bronx, N.Y., and Herman P. Smith, Warren, and Joseph W. Schroeder, Clark, N.J., assignors to Foster Wheeler Corporation, Livingston, N.J.
Filed Aug. 21, 1969, Ser. No. 851,998
Int. Cl. B21d *26/08*
U.S. Cl. 72—56 **2 Claims**



Apparatus for expanding a hollow inner tube into a hollow outer tube in which an explosive forming insert is mounted in the inner tube. The insert includes a two-piece coaxially polyethylene cylinder surrounding the explosive charge.

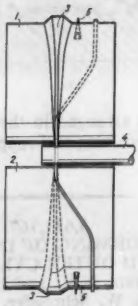
3,611,768
BULGING APPARATUS OF METALLIC PIPES
Eijiro Odagaki, Sakaishi, Osaka, Japan, assignor to Otsuya Tekko Kabushiki Kaisha, Sakaishi, Osaka, Japan
Filed June 30, 1969, Ser. No. 837,384
Int. Cl. B21d *15/10*
U.S. Cl. 72—58 **8 Claims**



An apparatus and method of using same for transforming a tubular blank into a shortened tubular member having a circumferentially extending section of a desired

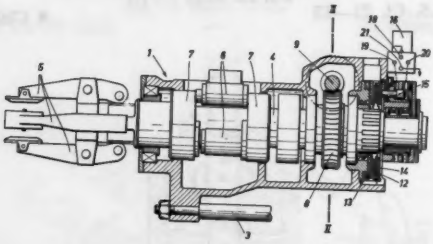
configuration and expanded diameter. The section of expanded diameter has substantially the same wall thickness as the balance of the tubular member after the forming operation is completed.

3,611,769
METHOD AND APPARATUS FOR SHAPING BAR STOCK BY ROLLING
Vladimír Hencl, Bilovice, Czechoslovakia, assignor to Vyzkumny ustav tvarecich stroju a technologie tvareni, Brno, Czechoslovakia
Filed May 6, 1969, Ser. No. 822,148
Int. Cl. B21h *9/00*
U.S. Cl. 72—71 **7 Claims**



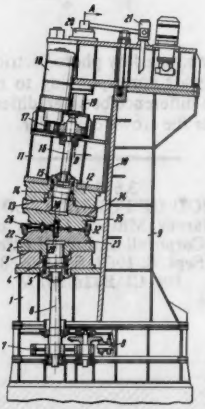
A pair of synchronously rotating rolls imparting rotation to stock positioned therebetween, the rolls being provided on their peripheries with circumferentially extending wedge tools having sections for grooving, guiding, forming and ultimately severing the stock. The guide sections of the tools are axially oblique, so that the stock is fed axially from the grooving to the forming operation as a function of tool rotation and the use of a separate stock feeding mechanism is not necessary.

3,611,770
SWAGING MACHINE AND GRIPPING HEAD
Bruno Kralowetz, Weinleiten 142, St. Ulrich, Steyr, Austria
Filed July 9, 1969, Ser. No. 840,420
Claims priority, application Austria, Aug. 1, 1968, A 7,490/68
Int. Cl. B29b *39/24*
U.S. Cl. 72—76 **8 Claims**



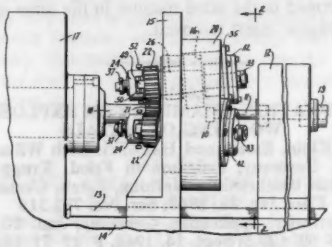
A swaging machine comprises means defining a path for a workpiece to be swaged and a gripping head which comprises a gripping head frame, a spindle which is rotatably mounted in said frame and axially aligned with said path, gripping jaws carried by said spindle and adapted to grip a workpiece to be swaged, drive means coupled to said spindle and operable to rotate said spindle on its axis. Said drive means comprise a spring system which is arranged to permit of a torsional vibration of said spindle. A hydraulic brake is applicable to brake said spindle. A hydraulic system is operable to apply said brake.

3,611,771
METHOD FOR ROLLING DISKS AND A DISK ROLLING MILL FOR THE PRACTICE OF THE METHOD
Otto Ulrych, Dortmund-Horde, Germany, assignor to Rheinstahl Wagner Werkzeugmaschinenfabrik m.b.H., Dortmund, Germany
Filed June 28, 1968, Ser. No. 740,873
Claims priority, application Germany, July 1, 1967, R 46,380
Int. Cl. B21h *1/02*
U.S. Cl. 72—84 **19 Claims**



Apparatus for rolling stock into contoured disks including upper and lower rolls having desired contours negatively on the working surfaces thereof which surfaces are obtuse angle conical surfaces wherein the upper roll is tilted from the vertical an amount sufficient to provide engagement between the two working faces on one side of the cone only. Pressure exerting means is shown adapted to urge the working surfaces together. Method of using this apparatus is described.

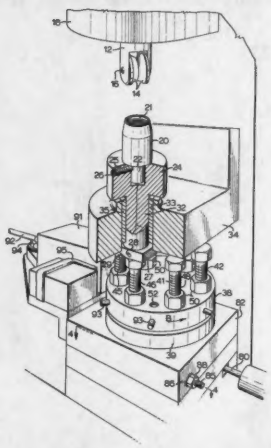
3,611,772
APPARATUS FOR ROLLING TOOTHED PARTS
Edward W. Haug, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.
Filed Sept. 29, 1969, Ser. No. 861,795
Int. Cl. B21d *15/04*
U.S. Cl. 72—105 **32 Claims**



A method and machine for rolling gears from a cylindrical workpiece in which the workpiece is rolled between dies which displace metal on the peripheral portion of the

workpiece to flow the metal of the workpiece so as to form gear teeth and the interdental spaces on the workpiece. In the ideal practice of the invention, the dies are designed so that essentially all of the work performed in forming the gear teeth is accomplished by having the die teeth apply a rolling force to work without applying a sliding force. In this ideal form, this is achieved by using conical dies with the pitch circles of the die teeth at the surface of the tip of the teeth from one end of the die to the other and with the base circles of the teeth the same throughout the length of the die. In most cases, the ideal tool is not practical because the die teeth would be structurally unsatisfactory but essentially the same results may be achieved by moving the pitch circle slightly inwardly from the tips of the teeth.

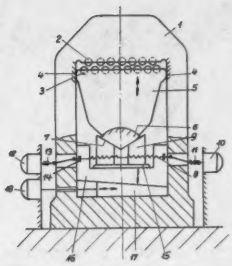
3,611,773
TURRET ANVIL RIVETING MACHINE
William Valentine Gerth, Waterloo, Ontario, Canada, assignor to Waterloo Spring Company Limited, Waterloo, Ontario, Canada
Filed Feb. 16, 1970, Ser. No. 11,672
Int. Cl. B21j *13/06, 15/32*
U.S. Cl. 72—115 **12 Claims**



A riveting machine having a reciprocable, spinning head for terminally deforming the shank of a rivet supported on an anvil is provided with a rotating turret mechanism for adjusting the axial separation between the anvil and the spinning head. The turret is formed as a rotatable turret plate having a number of upstanding abutment members, such as bolts, which selectively engage a cam shoe formed on the lower end of an axially reciprocable anvil. The heights of the abutment members may be preset to required different values or such abutment members may be adjustably mounted on the turret plate so that their heights can be adjusted as required.

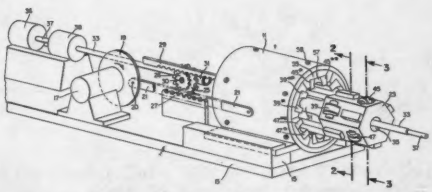
3,611,774
SHEET- AND STRIP-FLATTENING MACHINE ADJUSTABLE AT HIGH SPEED
Curt Munchbach, Pforzheim-Sonnenberg, Germany, assignor to Irma Ungerer, Pforzheim, Germany
Filed Jan. 17, 1969, Ser. No. 791,981
Claims priority, application Germany, Mar. 28, 1968, P 17 52 060.4
Int. Cl. B21d *1/02*
U.S. Cl. 72—165 **2 Claims**

A frame has vertical guideways spaced apart in a predetermined horizonal direction. Two cylindrically curved guide members are formed with surfaces each of which is at least a part of a surface of revolution centered on a generally horizontal axis that is transverse to said predetermined direction. A yoke is disposed between and in engagement with said guideways and formed on opposite sides of said frame with surfaces conforming to and resting on said surfaces of said guide members to support said yoke. A set of lower rolls extending generally horizontally and transversely to said predetermined direction



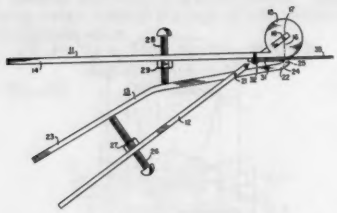
is carried by said yoke. A saddle is mounted in said frame for vertical adjustment. Adjustable wedge members carry the two guide members on opposite sides of said frame and are mounted on said saddle for adjustment relative thereto in a vertical direction and generally in the direction of said axis. A wedge is interposed between said saddle and said frame and horizontally movable to adjust said saddle at high speed in a vertical direction.

3,611,775
TUBE ROLLING MILL WITH A TAPERED MANDREL
Richard H. Gabel and Frank L. C. Williams, Norristown, Pa., assignors to Superior Tube Company, Norristown, Pa.
Filed July 29, 1969, Ser. No. 845,833
Int. Cl. B21b *17/10*
U.S. Cl. 72—193 **8 Claims**



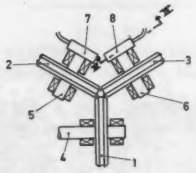
A tube rolling mill having two sets of three rolls each which are reciprocatingly driven along a length of a tube supported by a tapered mandrel. Each roll is forced against the tube by its individual cams each having a surface with one or more tapers which are related to multiple mandrel taper in a manner to provide reduction in both wall thickness and inside diameter of the tube. Each roll is provided with a tube contacting groove having in cross-section a central arc with a radius of curvature substantially equal to the smallest radius of that portion of the tube contacted by the roll, with either side of the central arc joined by lines tangent thereto with large radii of curvature chosen so that each roll contacts a tube in two zones around its circumference. The rolls are pressed against the tube upon the urging of the tapered cam surface against a roll trunnion. The radius of the trunnion is carefully chosen to control longitudinal forces transferred to the tube by the roll.

3,611,776
CRYSTAL BENDING TOOL
Richard L. Saunders, Fort Washington Forest, Md., assignor to the United States of America as represented by the Secretary of the Navy
Filed Oct. 22, 1969, Ser. No. 868,536
Int. Cl. B21d 7/02
U.S. Cl. 72—219 4 Claims



This disclosure is directed to a mechanical device or tool for bending crystals on a known radius without any deleterious effects on the crystal. One adjustable roller is moved on an arc relative to a fixed cylinder so that the roller maintains a desired radius with respect to the fixed cylinder to form a curved crystal having a specific thickness and curvature.

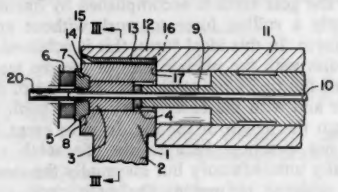
3,611,777
DRIVE FOR ROLLING MILL
Erich Bretschneider, Buderich, Germany, assignor to Siemag Siegener Maschinenbau GmbH, Dahlbruch, Germany
Filed Dec. 5, 1969, Ser. No. 882,461
Claims priority, application Germany, Dec. 13, 1968, P 18 14 460.0
Int. Cl. B21b 35/00
U.S. Cl. 72—249 4 Claims



This invention has to do with a rolling mill consisting of three cooperating rolls, one of which is positively driven and the other two are driven by a turbine-like motor.

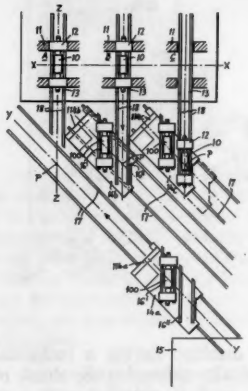
3,611,778
ALIGNING DEVICE FOR METAL EXTRUDING PRESSES
René Hubert, 4 Bis Avenue Jean-Baptiste Clement, 92 Boulogne-sur-Seine, France
Filed Dec. 11, 1968, Ser. No. 782,799
Claims priority, application France, Dec. 15, 1967, 132,414
Int. Cl. B21c 27/00
U.S. Cl. 72—272 7 Claims

A press for hot extruding a billet into products comprising a container for holding and positioning the billet along an extrusion axis, a die positionable at one end of said container, and a ram approaching said container from the opposite end of the die for forcing the billet through the container and a hole in the die. The ram, billet and container are aligned with the extrusion axis by an aligning means comprising a sleeve positioned concentrically and slideably about the ram and engageable with the con-



tainer means in a manner to provide for thermal expansion of the container.

3,611,779
ROLL-CHANGING DEVICES FOR HORIZONTAL ROLLING MILLS
Edwin Simmonds, Ringwood, England, assignor to Loewy Robertson Engineering Company Limited, Hampshire, England
Filed Jan. 12, 1968, Ser. No. 697,351
Claims priority, application Great Britain, Jan. 25, 1967, 3,789/67
Int. Cl. B21b 31/10
U.S. Cl. 72—239 3 Claims

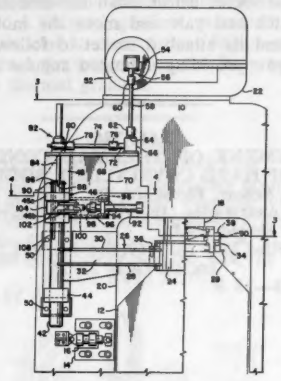


A roll-changing device for a horizontal rolling mill comprising a carrier having two parallel tracks at right angles to the roll-pass-line of the rolling mill, the said carrier being moveable along a track forming an oblique angle with the roll-pass-line and extending from a roll disposal area to the vicinity of the rolling mill.

3,611,780
THRUST BEARING MOUNTING ARRANGEMENT
John Rosario Buta, Salem, Ohio, assignor to Gulf + Western Industrial Products Company, Grand Rapids, Mich.
Filed June 10, 1969, Ser. No. 831,977
Int. Cl. B21b 31/24
U.S. Cl. 72—248 9 Claims

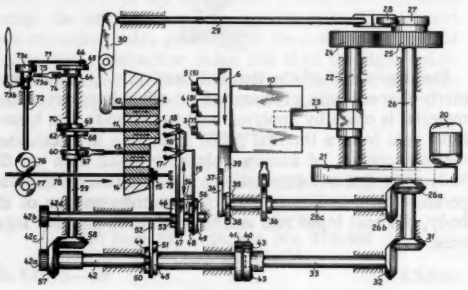
An apparatus particularly suited for facilitating removal of thrust bearings from between the screw-down screws and bearing chocks of a rolling mill. The apparatus described comprises horizontally swingable frames which carry the thrust bearings. The frames are also arranged for vertical movement and are connected through

mechanical drive trains with the drive for the screws. The drive trains function to move the frames vertically with



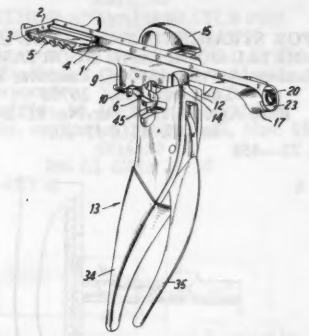
the screws to maintain the frames at the proper location for bearing removal.

3,611,781
MULTI-STAGE PRESS WITH A PLURALITY OF MATRICES AND DIES
Willi Pieper, Wuppertal, Germany, assignor to Gebr. Hilgeland, Ronsdorf, Germany
Filed June 20, 1969, Ser. No. 835,158
Claims priority, application Germany, June 21, 1968, P 17 52 610.2
Int. Cl. B21d *28/02*
U.S. Cl. 72—339 **5 Claims**



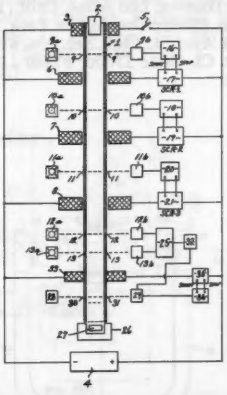
A multi-stage press with two matrices and three dies arranged on a die holder adapted to oscillate back and forth on a press carriage, in which two adjacent dies machine each workpiece in one in two succeeding pressing strokes while when looking in the direction of the driving train of the press the drive motor drives the crankshaft for the press carriage and through a step-down transmission with a step-down ratio of 1:2 drives the oscillating device for the die holder as well as those control means of the press which are located on the machine frame at the side of the matrix for pulling in the wire, shearing the wire, ejecting the blank from the shearing means, and which furthermore bring about the transport of the blank or the premachined workpiece to the first and second matrix and also bring about the ejection of the workpiece from the first matrix. In the driving train of the press behind the crankshaft and behind the output for the oscillating device in the driving train for the above mentioned control means there is provided a disengageable clutch through the intervention of which the position of the control means is variable with regard to the position of the carriage by an angle of 360° of the crankshaft for the carriage and with regard to the die holder is variable by 180° of the driving shaft therefor by rotating the driving elements located in the driving train behind the clutch with regard to the driving elements located in the driving train ahead of the clutch.

3,611,782
COMPRESSION TOOL FOR ELECTRICAL CONNECTORS
Daniel Eppler, Toms River, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Apr. 8, 1969, Ser. No. 814,348
Int. Cl. B21d *9/08*
U.S. Cl. 72—410 **3 Claims**



The invention relates to a compression tool for crimping connector lugs about electrical conductors, the tool having a sliding tray to accept connector blocks with a plurality of lugs pre-installed therein and, by using the connector block as one-half of the crimping die means, to selectively and sequentially crimp the lugs about a like number of electrical conductors.

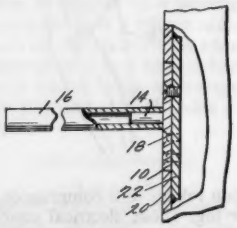
3,611,783
ELECTROMAGNETICALLY ENERGIZED IMPACT FORMING DEVICE
Eugene Mittelmann, Chicago, Ill., assignor to The Hill Acme Company, Cleveland, Ohio
Filed June 20, 1968, Ser. No. 738,656
Int. Cl. B21j *7/30*
U.S. Cl. 72—430 **5 Claims**



An electromagnetically energized impact forming device wherein a solid projectile is driven at a high velocity against a workpiece sufficient to cold work or forge the workpiece into a preselected configuration. The projectile is movable within a confining barrel or tube, one end of which is located at the station where the workpiece

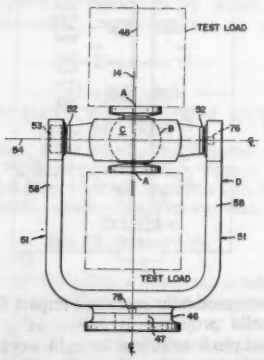
is placed. The workpiece may be disposed on and/or within any suitable work surface such as a forming die in such position to intercept the projectile moving through the barrel or tube. A plurality of coils surround the barrel and are electrically energized or pulsed in such manner as to generate magnetic fields longitudinally spaced along the length of the barrel and which are effective to propel the projectile toward and into engagement with the workpiece. The coils may be reversibly energized at the completion of the work stroke of the projectile to move and retain the projectile in a raised position to await the next succeeding cycle.

3,611,784
TOOL FOR STRAIGHTENING HINGE STRAPS ON METAL DOORS AND DOOR JAMBS
Reuben M. Prichard, 7252 Landover Road, Landover, Md. 20785
Filed Apr. 18, 1969, Ser. No. 817,311
Int. Cl. B21d *11/20*
U.S. Cl. 72—458 **2 Claims**



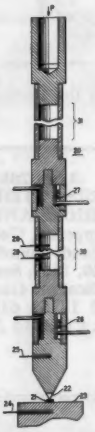
A tool for straightening hinge straps on metal door jambs or on the heels of metal doors, said tool having an apertured planar member and a member extending at right angles therefrom whereby the apertures in the planar member are matched with the apertures of the straps in the jamb or on the heel of the door and wherein a hollow pipe may be placed over the extending member so that the tool can be manipulated so as to move the hinge strap in the jamb or heel in a desired direction to place the strap into a desired configuration or position.

3,611,785
SPHERICAL AIR BEARING TEST CARRIAGE HAVING UNLIMITED ANGULAR MOTION
David G. Hanson, Los Altos, Calif., assignor to Carco Electronics, Menlo Park, Calif.
Filed Apr. 14, 1969, Ser. No. 815,564
Int. Cl. G01c *25/00*; F16m *11/14*
U.S. Cl. 73—1 **14 Claims**



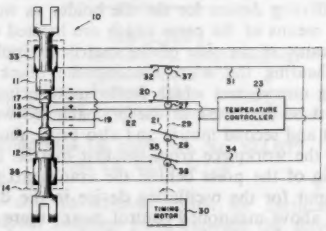
A guidance system test carriage is mounted on a bearing ball supported by air within a socket to provide unlimited carriage roll and limited table movement in pitch and yaw relative to the socket. The socket is in turn supported on a motored gimbal mounting. Sensors between the ball and socket detect small movements of the carriage in pitch and yaw and move the motored gimbal mounting and its attached socket to follow carriage in pitch and yaw providing unlimited angular carriage motion.

3,611,786
MEASUREMENT OF THERMAL CONDUCTIVITY OF HARD CRYSTALLINE BODIES
Anthony J. Schorr, Birdsboro, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.
Filed May 23, 1969, Ser. No. 827,197
Int. Cl. G01p *25/18*
U.S. Cl. 73—15 R **1 Claim**



Determination of the thermal conductivity of an irregularly-shaped body of diamond or other hard crystalline material is made by applying heat to the body at a known input rate from a thermal probe through a low resistance thermal contact of known, relatively small area on the body. The thermal conductivity is a function of the temperature drop as observed through a finite portion of the body, the heat input rate and the radius of the heat input area.

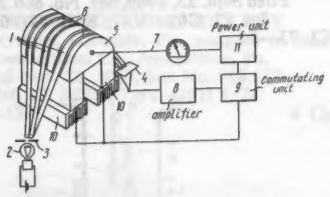
3,611,787
APPARATUS FOR MINIMIZING THERMAL GRADIENT IN TEST SPECIMENS
Anthony T. D'Annessa and Harvard H. Kranzlein, Sr., Marietta, Ga., assignors to Lockheed Aircraft Corporation, Burbank, Calif.
Filed June 11, 1969, Ser. No. 832,383
Int. Cl. G01n *3/18*
U.S. Cl. 73—15.6 **3 Claims**



Apparatus for eliminating or minimizing the thermal gradient which occurs across a test specimen undergoing a tensile test, especially at non-ambient temperatures. A test specimen being evaluated at an elevated temperature

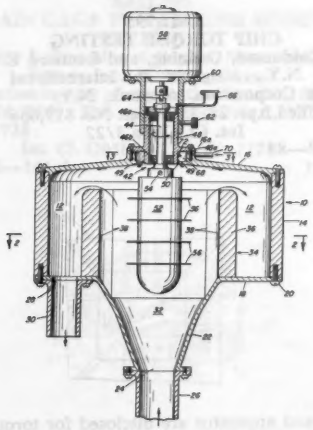
may undergo a significant and undesired thermal gradient throughout a dimension of the specimen, and this thermal gradient can introduce substantial inaccuracies in the test data obtained. A thermal gradient measured along the test specimen is used to control the addition or subtraction of heat from the specimen as necessary to minimize the unwanted thermal gradient.

3,611,788
DEW-POINT HYGROMETER
Anatoly Kuzmich Amelkin, Leningradsky prospekt 2, kv. 13; Nikolai Sergeevich Nikolaev, Ploschad, Vosstania 1, kv. 44; and Mikhail Mikhailovich Sergeev, Koptevskaya ulitsa 18b, kv. 47, all of Moscow, U.S.S.R.
Filed Oct. 8, 1969, Ser. No. 864,578
Int. Cl. G01n *25/02*
U.S. Cl. 73—17 A **3 Claims**



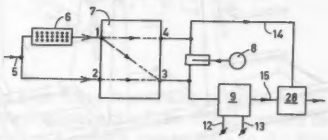
A dew-point hygrometer employs a light guide placed in a gaseous medium and having a refractive index greater than the gaseous medium being monitored but less than the refractive index of the condensate formed by cooling the medium. The light guide is illuminated at one end and the transmitted light flux is applied onto a photocell which controls the temperature of a support on which an intermediate portion of the light guide is bent and supported through the intermediary of a backing strip. The support has a refractive index greater than the condensate and the backing has a refractive index less than the light guide. The temperature of the support is monitored to determine the temperature of condensate formation.

3,611,789
ROTARY MOTION CONSISTENCY METER
Kasimir Lopas, 118 Skyview Drive, Stamford, Conn. 06902
Filed Nov. 10, 1969, Ser. No. 875,468
Int. Cl. G01n *11/16*
U.S. Cl. 73—59 **15 Claims**



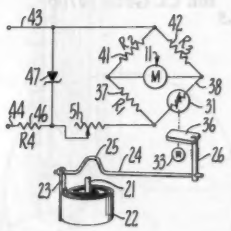
Two rotary motion consistency meter embodiments are disclosed, one with continuous and one with oscillatory rotary motion. In both embodiments a fiber containing stock solution is circulated through the meter and the fibers are allowed to staple over the edges of thin, planar blades which are rotated in the stock solution by a motor having a constant output. The stapling produces hydraulic drag against the motor which causes an output variable of the motor to vary in a measurable manner as an indicator of stock consistency. The meters are provided with expansion chambers to slow down stock velocity through the meter, and with means for keeping the meters free from fiber clogging.

3,611,790
METHOD AND APPARATUS FOR QUANTITATIVE ANALYSIS
Harm Jan Brouwer and Scout Michael de Veer, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 10, 1969, Ser. No. 875,233
Claims priority, application Netherlands, Nov. 19, 1968, 6816450
Int. Cl. G01n *27/50*
U.S. Cl. 73—61.1 R **5 Claims**



By using filters and calibrating sources which can be inserted, either singly or in combination in the supply pipe of a fluid flow upstream of a measuring cell, constituents of the fluid flow can be measured continuously and quantitatively so as to be related to the zero and calibrating points obtained. The arrangement for carrying out the method is provided with an interconnection device for zero point determination, calibration and measurement and can be used in unattended measuring stations using remote control and remote measurement.

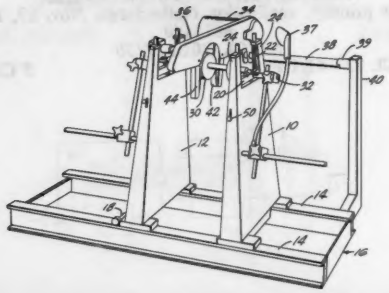
3,611,791
REMOTE AIR TEMPERATURE INDICATOR
Robert L. Wilbur, North Windham, Maine, assignor to The Eastern Company, Portland, Maine
Filed Dec. 22, 1969, Ser. No. 887,105
Int. Cl. G01k *5/72*
U.S. Cl. 73—363.7 **4 Claims**



A linear output meter with a range reading from −40° F. to +120° F. is provided across the arms of a Wheatstone bridge. One branch of an arm of the Wheatstone bridge includes a photoelectric cell, the resistance of which is dependent on how much light falls on the cell. The cell is provided at a location remote from the meter. A constantly burning electric light is provided in association with

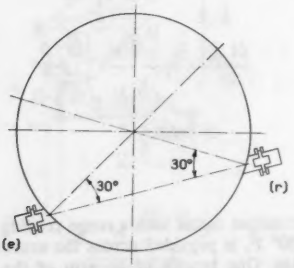
the photoelectric cell and the amount of light passing to the cell is controlled by a shutter moved by a bimetallic coil strip which is located in the region where it is desired to ascertain the temperature. The movement of the coil strip in turn moves the shutter which varies the amount of light falling on the photoelectric cell from the light and so varies the resistance of the cell, upsetting the bridge circuit.

3,611,792
CABLE SUSPENSION SYSTEM FOR BALANCING MACHINES
Gordon E. Hines, Ann Arbor, Mich., assignor to Balance Technology, Inc., Ann Arbor, Mich.
Filed July 28, 1969, Ser. No. 845,248
Int. Cl. G01m *1/16*
U.S. Cl. 73—478 15 Claims



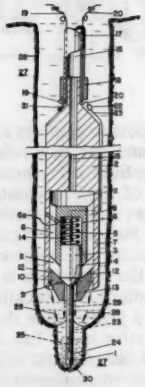
A soft suspension system for a balancing machine wherein the bearing carriers are suspended by cables. The cables are mounted on the carrier by a rigid connection and to stanchions of the machine by vertically adjusting means that adjust the height of the carrier without changing the length of the cables. Locking jaws having a particular toggle linkage actuator are provided to lock the carriers against vertical and lateral motion while permitting the carriers to pivot.

3,611,793
METHOD AND APPARATUS FOR CONTROLLING CONTINUOUS LYE-WASHING IN PREPARING PULP FOR PAPERMAKING
Roger Cerf, Strasbourg, Bas-Rhin, France, assignor to Aktiebolaget Kamyr, Karlstadt, Sweden
Filed July 25, 1968, Ser. No. 747,746
Claims priority, application France, July 28, 1967, 8,950
Int. Cl. G01n *24/00*
U.S. Cl. 73—67.5 6 Claims



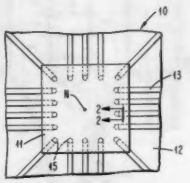
A method for inspection of continuous lye-washing or digestion in the preparation of paper pulp, and an apparatus for carrying out the method, wherein this inspection is defined by the obtaining of information as to the attenuation of an acoustic wave passing through the reaction medium of the digester, created by an ultrasonic beam emitted by a transducer and picked up by a second transducer forming a receiver, both of which are mounted at a fixed distance, their common axis being at 30° to a diameter of the digester, both resonating on the same frequency, which is high enough and low enough to avoid stray waves and to permit despite several factors of receiving a signal which is large in comparison with stray signals.

3,611,794
APPARATUS AND METHOD FOR DETERMINING THE SOIL RESISTANCE OF A SUBTERRANEAN EARTH FORMATION
Pieter J. de Geeter, Rijswijk, Netherlands, assignor to Shell Oil Company, New York, N.Y.
Filed Sept. 23, 1969, Ser. No. 860,262
Int. Cl. G01n *3/42*; E21b *49/00*
U.S. Cl. 73—84 6 Claims



Apparatus and method for determining the soil resistance of a subterranean earth layer by driving a sounding pin carried by a body into the layer utilizing the weight of the body to drive the pin through the layer. The forces exerted on the pin are measured and recorded and soil within the layer is washed away while driving the pin therethrough.

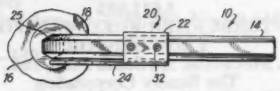
3,611,795
CHIP TORQUE TESTING
Lewis S. Goldmann, Ossining, and Leonard E. Liander, Fishkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 28, 1969, Ser. No. 819,856
Int. Cl. G01n *3/22*
U.S. Cl. 73—88 1 Claim



Method and apparatus are disclosed for torque testing a semiconductor device. The device is of the type in which a semiconductor wafer or chip is mounted on a substrate by a plurality of solder columns spaced around

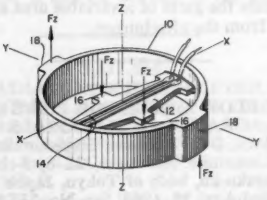
the chip. In use, such devices are subject to thermal cycling and hence are subjected to thermal stresses due to the different thermal expansion characteristics between the chip and substrate. The interaction of the thermal stresses exerted by the various columns produces a neutral point in the chip. The resultant thermal strains induced in the several joints are proportional to the distance from this neutral point. The testing method comprises rotating the chip relative to the substrate until it ruptures therefrom and, during such rotation, measuring the amount of torque as a function of the angle of twist or rotation. Apparatus carries out the method by holding the semiconductor device, rotating the chip relative to the base, measuring the torque and degree of twist, and plotting such characteristics to provide a record thereof.

3,611,796
TORQUE INDICATING HEX KEY
Walter H. Hayward, Glenside, Pa., assignor to Standard Pressed Steel Co., Jenkintown, Pa.
Filed Nov. 28, 1969, Ser. No. 880,613
Int. Cl. B25b *23/14*; G01l *5/24*
U.S. Cl. 73—139 **4 Claims**



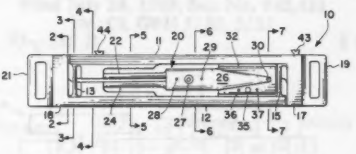
A hex key wrench with a torque indicating device which is adjustably attached to the torque applying leg of the wrench. The torque indicating device has an indicating arm extending along the torque applying leg of the wrench in spaced relation thereto to a point adjacent the bolt engaging leg of the wrench. The torque applying leg of the wrench deflects slightly when the wrench is used to tighten a bolt and, since the indicating device is fixed to the torque applying leg at one end, the end fixed to the torque applying leg also deflects thus causing the other end of the indicating arm to contact the relatively stationary bolt-engaging leg of the wrench. The length and position of the indicating arm is selected to be representative of a particular torque and when the arm contacts the bolt engaging leg, a visual indication may be made that the desired torque has been applied.

3,611,797
STRAIN GAGE TRANSDUCER SENSING ELEMENT
Jean Pierre A. Pugnaire, Arlington, Mass., assignor to Bytrex, Inc., Waltham, Mass.
Continuation-in-part of application Ser. No. 827,529, May 26, 1969. This application Feb. 2, 1970, Ser. No. 7,728
Int. Cl. G01l *5/12, 9/00, 1/22*
U.S. Cl. 73—141 A **10 Claims**



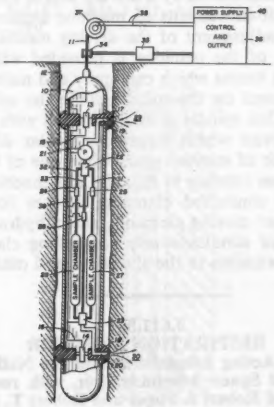
A thin-walled, radially compliant, cylindrical ring carries a diametric beam to which strain gages are attached. A downward load is applied to the middle of the beam. A pair of tabs projecting laterally from opposite sides of the ring on an axis perpendicular to the beam axis support the transducer and the upward reaction force is applied to the ends of the beam solely through these tabs and the intervening portions of the ring.

3,611,798
MAGNIFYING SCRATCH GAGE FORCE TRANSDUCER
Charles E. Scott, Yorktown, Va., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Feb. 19, 1970, Ser. No. 12,661
Int. Cl. G01l *1/04*
U.S. Cl. 73—141 A **13 Claims**



A passive type force transducer wherein forces exerted along the longitudinal axis of the transducer are magnified and displayed as a scratch transversely to the direction of force.

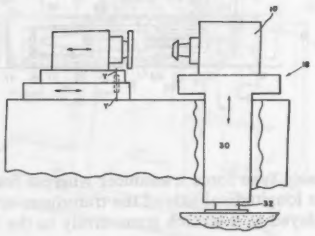
3,611,799
MULTIPLE CHAMBER EARTH FORMATION FLUID SAMPLER
Mike Davis, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Oct. 1, 1969, Ser. No. 862,821
Int. Cl. E21b *43/00*
U.S. Cl. 73—155 **10 Claims**



A multiple chamber sampling system for obtaining fluid samples from earth formations wherein a borehole exploring unit supported for movement through the borehole is provided with spaced means for isolating borehole wall formation portions from borehole fluids. A flow channel selectively interconnects the isolation means and has a pump therein for producing fluid flow from the

formation through the flow channel back into the formation. Engaging units contact the formations and fluid therein is pumped from one formation to another or from one portion of a formation to another portion of the same formation. A set of valves controllable from the surface provides means for filling the multiple sampling chambers and transducers provide indications of various physical characteristics of the fluid. Means are provided for determining the exploring units's depth in the borehole.

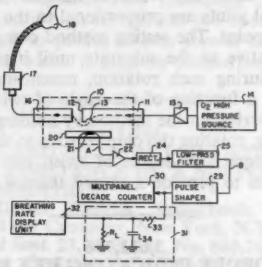
3,611,800
MACHINE FOR PROCESSING OR TESTING GEARS
Mason M. Howlett and Philip F. White, Rochester, N.Y., assignors to The Gleason Works, Rochester, N.Y.
Filed Apr. 27, 1970, Ser. No. 32,007
Int. Cl. G01m *13/02*
U.S. Cl. 73—162 **23 Claims**



A universal gear-testing machine for testing a pair of gears mounted on two spindles carried by the machine. The weight of one spindle assembly being carried by a vertically displaceable support column, and the weight of the other spindle assembly being carried by the machine frame. The support column includes an adjustment means for effecting vertical adjustments, and the weight supported by the column is relieved from the adjustment means by a fluid pressure counterbalance system so that adjustment can be precisely and easily effected. One of the spindles of the machine is driven by a driving means which permits a full range of movements of machine elements without requiring an adjustment of the driving means itself. The other spindle of the machine is provided with an automatic braking means which can apply and maintain a preset braking force on the spindle while the spindle is being rotated. One spindle is also provided with a backlash measuring device which measures angular displacement between a pair of meshed gears when one of the gears is prevented from rotating in its axis. The machine includes hydraulically controlled clamping devices for its slideways and other moving elements, and a hydraulic system is provided for simultaneously controlling clamping and providing lubrication to the slideways and other surfaces.

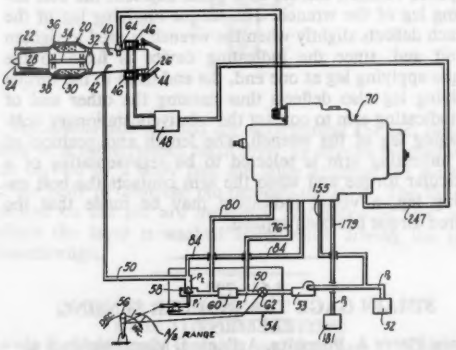
3,611,801
RESPIRATION MONITOR
T. O. Paine, Acting Administrator of the National Aeronautics and Space Administration, with respect to an invention of Robert J. Fagot and Robert T. McDonald, both of Littlerock, Calif., and James A. Roman, Vancouver, Wash.
Filed Oct. 28, 1968, Ser. No. 771,216
Int. Cl. G01f *1/04*
U.S. Cl. 73—194 A **5 Claims**

A respiration monitor which may be inserted directly into a high-pressure oxygen line is provided by a capped tube adapted to be connected to a source of oxygen under pressure. A hole on the side of the tube allows oxygen to escape into a sealed chamber having an outlet port adapted to be connected to a face mask through a regulator. A microphone placed opposite the hole detects turbulence created by oxygen turning 90° to escape. A



signal from the microphone is conditioned to derive desired information, such as respiration rate and total breaths.

3,611,802
AFTERBURNER FUEL MANIFOLD FLOW SENSOR
Howard L. McCombs, Jr., South Bend, Ind., assignor to The Bendix Corporation
Filed Dec. 3, 1968, Ser. No. 782,012
Int. Cl. G01f *5/00*
U.S. Cl. 73—203 **8 Claims**



Apparatus for sensing the rate of fuel flow into an afterburner fuel manifold and energizing ignition apparatus for a predetermined time interval to ignite the afterburner fuel flow when the manifold is filled to a predetermined extent as well as providing a simultaneous output signal to release the gates of a variable area exhaust nozzle downstream from the afterburner.

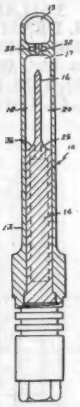
3,611,803
IMPACT FLOW METER FOR POWDERY AND GRANULAR MATERIALS
Hiroshi Kajiura, 1–5, 2-chome, Higashinakano, Nakanoku, and Kinnosuke Watanabe, 22–8, 3-chome, Nishiochiai, Shinjuku-ku, both of Tokyo, Japan
Filed Aug. 28, 1968, Ser. No. 755,983
Int. Cl. G01f *1/12*
U.S. Cl. 73—228 **3 Claims**

An impact flow meter for powdery and granular materials characterized in that a stream of powdery or gran-

ular material dropping from a certain height is once divided into a plurality of sub-streams and then the sub-

streams are merged before dropping with an impact on an impact-receptive detecting plate.

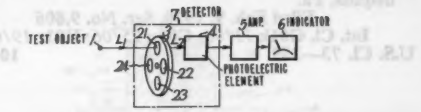
3,611,804
FLUIDIC TEMPERATURE SENSOR WITH U-SHAPED RESONANT CAVITY
Charles E. Bentz, Dayton, Ohio, assignor to the United States of America as represented by the Secretary of the Air Force
Filed Apr. 30, 1970, Ser. No. 33,445
Int. Cl. G01k *11/26*
U.S. Cl. 73—349 **9 Claims**



A fluidic temperature sensor having a target vane positioned opposite an inlet orifice in a tubular housing wherein the target vane divides the cavity to form a substantially U-shaped resonant cavity wherein the frequency is a function of the temperature of the test gas entering the sensor cavity. The pressure signal is converted to an electrical signal by a piezoelectric transducer. In operation the small sensor is located directly in the gas flow of a turbine inlet.

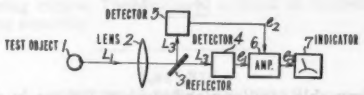
3,611,805
RADIATION THERMOMETER
Isao Hishikari, Tokyo, Japan, assignor to Kabushikikaisha Chino Seisakusho (Chino Works, Ltd.), Tokyo, Japan
Filed July 28, 1969, Ser. No. 845,301
Int. Cl. G01j *5/08, 5/60*
U.S. Cl. 73—355 R **3 Claims**

A radiation thermometer having a detector including a photoelectric conversion element converting energy radiated from an object to be measured into a corresponding electric signal and an optical filter means passing some components of the energy having a predetermined wavelength range, a detector having the spectral sensitivity corresponding to the effective wavelength of the energy, and



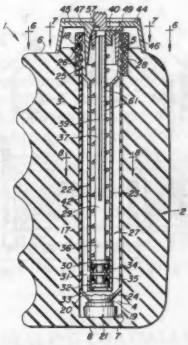
temperature indicating means for indicating the temperature of the object.

3,611,806
RADIATION THERMOMETER
Isao Hishikari, Tokyo, Japan, assignor to Kabushikikaisha Chino Seisakusho (Chino Works, Ltd.), Tokyo, Japan
Filed July 28, 1969, Ser. No. 845,421
Int. Cl. G01j *5/30, 5/52*
U.S. Cl. 73—355 R **6 Claims**



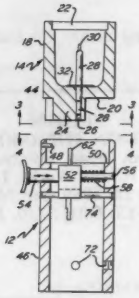
A radiation thermometer having means for detecting energy emitted from an object to be measured and generating electric signal corresponding to the energy, means for amplifying the electric signal, means for generating electric signal in accordance with the energy from the object, means for controlling gain of the amplifying means by the second mentioned electric signal, and means for indicating the temperature of the object by means of the output signal from the amplifying means.

3,611,807
EXERCISING GRIPS
John R. Brandell, 1527 Sequoia Trail, Glenview, Ill. 60025
Filed Apr. 27, 1970, Ser. No. 32,229
Int. Cl. G01l *5/02;* **A63b** *21/30*
U.S. Cl. 73—379 **10 Claims**



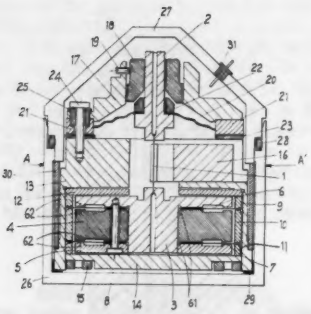
An exercising grip having a resilient compressible body member having working fluid therein, and with an indicating piston slidably mounted in the body member for movement outwardly thereof by the working fluid upon manual gripping of the body member and movement thereinto upon release of such gripping thereof, the grip also including a latch for selectively holding the piston against movement out of the body member.

3,611,808
DISPOSABLE SAND CUP AND SUPPORT
Joseph J. Boron, Doylestown, and Thomas A. Lupperger, Philadelphia, Pa., assignors to Electro-Nite Co., Philadelphia, Pa.
Filed Feb. 9, 1970, Ser. No. 9,806
Int. Cl. G01k 11/06; G01n 25/06; H01r 19/02
U.S. Cl. 73—359 10 Claims



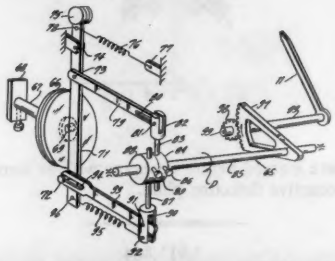
A disposable sand cup and support for use in connection with measuring carbon content of iron or steel is disclosed. The cup contains horizontally disposed thermocouple wires which are partially exposed for contact with movable contact pins on the cup support.

3,611,809
VIBRATING STRING GRAVIMETERS
Michel Cantat and Raymond Mathey, Paris, France, assignors to CSF-Compagnie Generale de Telegraphie Sans Fil, Paris, France
Filed July 2, 1968, Ser. No. 741,967
Claims priority, application France, July 6, 1967, 113,417
Int. Cl. G01v 7/04
U.S. Cl. 73—382 3 Claims



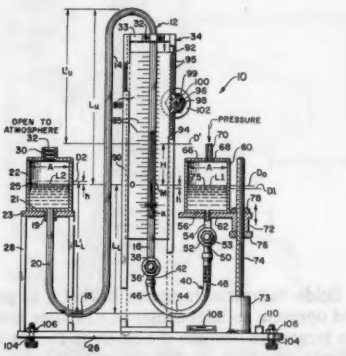
A vibrating string gravimeter comprising, inside a housing, a mass suspended on a vibrating string, which is attached to the housing and vibrates in the field of a permanent magnet. At least two elastic parallel diaphragms attach the mass to the housing. The mass and the housing have plane and polished horizontal surfaces facing each other and at a distance from each other adjusted for damping the displacements of the mass by lamination of air between these surfaces.

3,611,810
DRIVE MEANS FOR POINTER OF AIRCRAFT INSTRUMENT
John H. Andresen, Jr., Rocky Point, N.J., assignor to Intercontinental Dynamics Corporation, Englewood, N.J.
Filed Dec. 10, 1969, Ser. No. 883,978
Int. Cl. G01l 7/00
U.S. Cl. 73—397 4 Claims



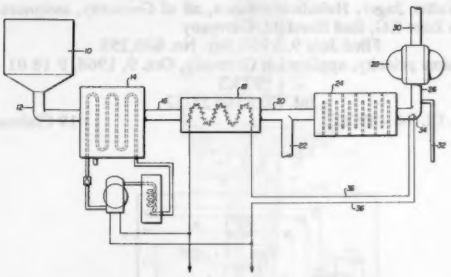
An aircraft instrument is constructed so that the pointer thereof is driven successively by one or the other of two different link-lever systems in which the link and lever are joined by a slot pin connection to produce a pointer drive range and/or direction which is programmed to change in relation to a signal, changing steady rate, which mechanically drives the pointer.

3,611,811
DIFFERENTIAL DENSITY MANOMETER
Frederic Lissau, Forest Hills, N.Y., assignor to Liquidonics, Inc., Westbury, N.Y.
Filed Mar. 27, 1970, Ser. No. 23,367
Int. Cl. G01l 7/18
U.S. Cl. 73—401 10 Claims



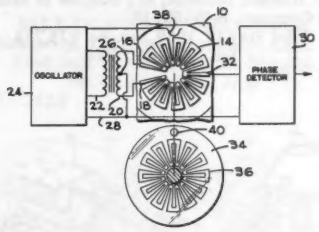
A manometer for accurately measuring extremely small changes in fluid pressures employs an inverted vertical U-shaped tube assembly having a narrow uniform bore throughout its length. Two upwardly turned leg portions are connected to two containers of equal size containing two fluids of different colors and densities. The fluids fill the tube and meet at a meniscus whose position in the tube is read on a graduated scale adjacent to the transparent tube. The scale is adjustably movable along the tube. The height of one container is also adjustable. Either one of the containers may be open to the atmosphere while the other container is open to a source of variable pressure. Any change in the variable pressure produces a change in scale reading. The distance the meniscus moves upon a change in pressure depends on the ratio of densities and ratio of cross sectional area of one container to the cross sectional area of the bore of the tube.

3,611,812
SAMPLING PROCESS FOR COMBUSTION GASES
Allen Cleveland, Ann Arbor, Mich., assignor to Olson Laboratories, Inc., Dearborn, Mich.
Filed May 13, 1970, Ser. No. 36,876
Int. Cl. G01n *1/22*
U.S. Cl. 73—421.5 R 5 Claims



A sampling process for combustion gases which includes the steps of introducing a continuous stream of ambient air into a conduit system, reducing the temperature of the ambient air to not more than about 40° F., subsequently heating the air to about 130° F., introducing exhaust gases into the system downstream from the heated air and mixing it with the heated air, passing the mixture of gases through a heat sink to obtain a uniform temperature, exhausting the gases from the heat sink at a constant volume, and drawing off a quantity of gas into a sample tube.

3,611,813
TACHOMETER
Dale Brocker, 19525 Forest Ave., Castro Valley, Calif.
Continuation-in-part of application Ser. No. 727,911, May 9, 1968. This application Feb. 20, 1970, Ser. No. 13,185
Int. Cl. G01p *3/44*
U.S. Cl. 73—518 2 Claims



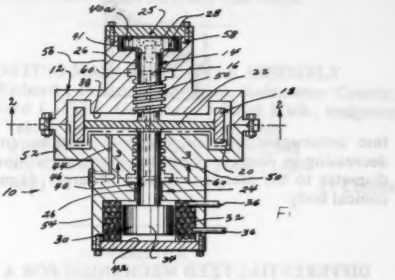
A tachometer including a fixed pattern having an input signal applied thereto, and a cooperating rotary pattern arranged to modulate the input signal at a rate proportional to the rate of rotation.

ERRATUM

For Class 74—5 see:
Patent No. 3,612,160

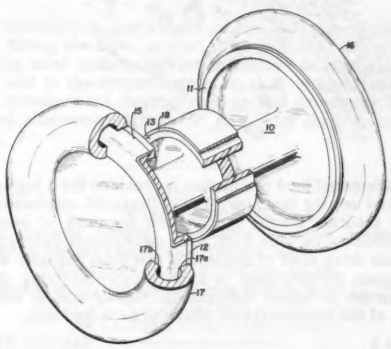
3,611,814
SPIN ROTOR ASSEMBLY
August F. Haack, and Semon P. Vincent, both of Torrance, Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed July 24, 1969, Ser. No. 844,583
Int. Cl. G01c *19/02*
U.S. Cl. 74—5 14 Claims

A high-speed spin rotor assembly having a hermetic casing filled with gas, preferably under subatmospheric pressure, and containing a motor-driven spin rotor including an inertial wheel with a central shaft rotatably supported by gas bearing means. Pumping means, such as helical pumping grooves surrounding the shaft, are provided for continuously pumping



gas from the interior region of the casing surrounding the inertial wheel to the gas bearing means to reduce the viscous drag of the gas on the wheel and concurrently pressurize the gas bearing means. The disclosed method of operating the spin rotor assembly.

3,611,815
FRICTIONLESS GYROSCOPE
Robert E. Fischell, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy
Filed Dec. 24, 1969, Ser. No. 887,954
Int. Cl. G01c *19/24*
U.S. Cl. 74—5.7 7 Claims

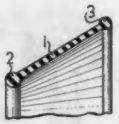


A substantially friction free gyroscope structure comprises a cylindrical rotor member whose ends are encompassed by a pair of annular permanent magnets. Each end of the rotor member carries a diamagnetic insert which coacts with the associated permanent magnet to establish repulsive magnetic forces which keep the rotor out of physical contact with the permanent magnet; i.e., the rotor is made to float with substantially zero friction. The possibility of eddy current losses is minimized both internal and external of the gyroscope by constructing the rotor of an electrically nonconductive material such as Fiberglas, for example, and by reason of the magnetic symmetry of the permanent magnets.

3,611,816
SLEEVE FOR SEALING COAXIALLY ARRANGED PARTS
Gerhard Wedekind, Hannover-Linden, and Karl Schulz, Hannover, both of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany
Filed June 2, 1969, Ser. No. 829,170
Int. Cl. F16j *15/52*
U.S. Cl. 74—18.2 6 Claims

A sleeve of rubber material for covering up coaxially arranged members, especially shafts and housings, movable relative to each other in at least one of the following

directions: axial direction, eccentric direction; and angular direction; said sleeve including a hollow conical body having marginal sections with bead means and an intermediate sec-



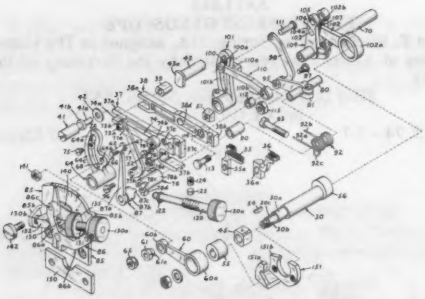
tion interconnecting said marginal sections and gradually decreasing in diameter from the marginal section of smaller diameter to the marginal section of larger diameter of said conical body.

3,611,817

DIFFERENTIAL FEED MECHANISM FOR A SEWING MACHINE

Clarence C. Smith, Chicago, and Henry Szostak, Oak Park, both of Ill., assignors to Union Special Machine Company, Chicago, Ill.

Filed May 26, 1969, Ser. No. 827,685
Int. Cl. D05b 27/08; F16h 21/32
U.S. Cl. 74—40 **15 Claims**



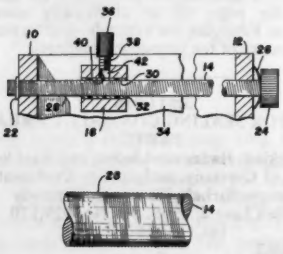
A differential feed mechanism is provided for a high-speed industrial sewing machine. The differential mechanism includes separate driving mechanisms for each of two feed dogs mounted on feed bars, both mechanisms connected to the main drive shaft of the sewing machine. Separate adjusting means are provided in each of the feed dog driving mechanisms to adjust individually, rapidly and at will, the length of the horizontal feed stroke of each feed dog.

3,611,818

TRANSLATION CONTROL MECHANISM

Richard H. Burns, Webster, and Helmut Welker, Jamestown, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 6, 1969, Ser. No. 863,883
Int. Cl. F16h 27/02, 1/18, 55/04
U.S. Cl. 74—89.15 **13 Claims**



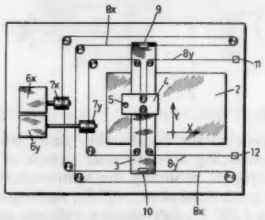
A control for transmitting motion comprises a shaft having a surface finish with a predominantly helical lay, the control being slidably and rotatably engaged with a following block at a uniform deformable surface formed thereon. A control device is provided for controlling the engagement by controlling the amount of pressure exerted by the uniform deformable surface upon the spirally grooved shaft.

3,611,819

MOTION-TRANSMITTING ARRANGEMENT

Jurgen Muller, Bad Hersfeld; Manfred Hoppe, Friedlos, and Walter Jager, Heimboldshausen, all of Germany, assignors to Zuse KG, Bad Hersfeld, Germany

Filed July 9, 1969, Ser. No. 840,258
Claims priority, application Germany, Oct. 9, 1968, P 18 01 973.3
Int. Cl. F16h 55/52
U.S. Cl. 74—89.22 **19 Claims**



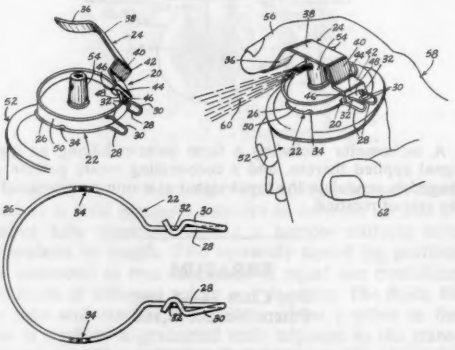
A drafting head of a drafting apparatus is mounted for to-and-fro movement in a predetermined direction. A flexible elongated rope is connected to the drafting head for exerting pull thereon to thereby move it in this predetermined direction. A rotatable drum is mounted for rotation about its axis and has the rope convoluted about its circumference. The drum includes a radially expansible annular member and end disks cooperating therewith for expanding and contracting it so as to vary the diameter of the drum; a drive serves to rotate the drum about its axis.

3,611,820

SPRAY-VALVE-ACTUATING DEVICE

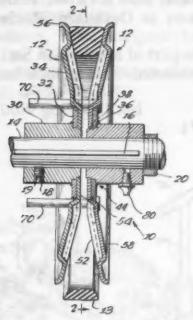
Herbert W. Hempel, Belleville, Ill., assignor to Marsh Stencil Machine Company, Belleville, Ill.

Filed May 19, 1969, Ser. No. 825,774
Int. Cl. F16h 21/44
U.S. Cl. 74—102 **2 Claims**



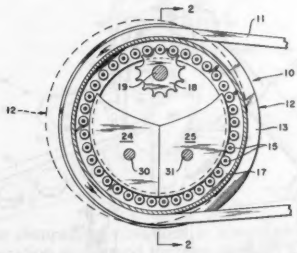
The present device is a novel spray-valve-actuating device for aerosol spray product containers which includes a split annular wirelike base element or clamp for mounting on the neck of a container and a compact valve actuating lever pivotally operatively connected to the base element and removably securing it in mounted position when the device is on a container.

3,611,821
VARIABLE SPEED DRIVE PULLEY
William F. Legler, Bettendorf, Iowa, assignor to J. I. Case Company
Filed Sept. 8, 1969, Ser. No. 855,969
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 10 Claims



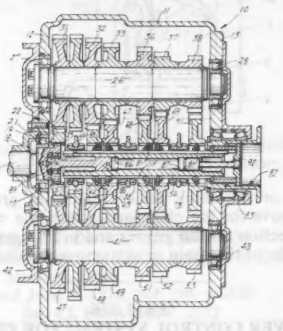
A variable speed pulley in which the two sheave halves are identical in construction and each includes a hub, a flat substantially circular plate fixed to the hub, and a sheet metal disc defining the bearing surface for a belt received between the sheave halves. The plate has circumferentially spaced radially extending slots extending from the peripheral surface towards the center thereof and the sheet metal disc has deformed portions circumferentially spaced and extending radially to define elongated ribs, the inner ends of which are received in the slots on the plate. The plate and disc are interconnected and the ribs and slots cooperate to prevent relative rotation between the plate and disc. The variable speed pulley may also include pins fixedly secured in one set of openings defined on one sheave half and having opposite ends received in identical openings in the second sheave half with the pins cooperating to define the minimum diameter of the pulley.

3,611,822
BELT-TIGHTENING MECHANISM
Martin I. Sanderson, 132 Grove St., Salinas, Calif.
Filed Sept. 29, 1969, Ser. No. 863,420
Int. Cl. F16h *7/08, 1/06*
U.S. Cl. 74—242.9 10 Claims



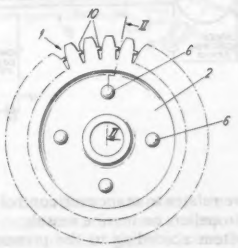
Mechanism for automatically adjusting the tension in a drivebelt in accordance with changes in the magnitude of the required power transmission therealong. The mechanism includes a pulley wheel adapted to have an endless belt entrained thereabout, and the wheel is annular so as to provide an open interior about which are located a plurality of angularly spaced rollers defining the teeth of an internal ring gear meshingly engaged by a spur gear mounted upon a power shaft. The pulley wheel is rotatably supported by a plurality of support segments located within the interior of the wheel in rolling engagement with the rollers. The segments are connected with hanger structure located along the exterior of the pulley wheel and carried by the drive shaft for angular displacements relative thereto. Whenever the requirement for increased power transmission along the belt occurs, the hanger structure, support segments, and drive pulley swing angularly about the axis of rotation of the shaft in a direction to increase the tension in the belt, and vice versa.

3,611,823
FLOATING MAIN DRIVE GEAR ASSEMBLY
Elmer A. Richards, Oshtemo Township, Kalamazoo County, and Edward L. Zahn, Galesburg, both of Mich., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed July 22, 1969, Ser. No. 843,386
Int. Cl. F16h *3/08, 57/00;* F16d *11/00*
U.S. Cl. 74—331 11 Claims



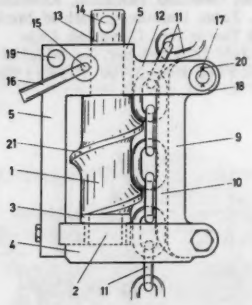
A transmission, particularly of the multiple countershaft type, having the input or main drive gear floatably mounted for free axial rocking movement relative to both the input shaft and to the transmission main shaft to compensate for axial misalignment therebetween as said drive gear is connected alternately directly to said main shaft or to ratio gears.

3,611,824
WORM GEARING
Derek Norman Stevens, Dunstable, England, assignor to General Motors Corporation, Detroit, Mich.
Filed June 11, 1970, Ser. No. 45,306
Claims priority, application Great Britain, June 12, 1969, 29,727/69
Int. Cl. F16h *57/00, 55/04, 55/14*
U.S. Cl. 74—411 5 Claims



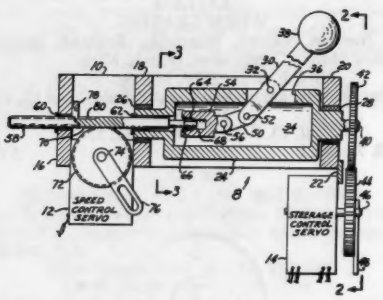
In order to overcome the disadvantage of insufficient ductility in glass filled nylon as a material for gear wheels, the teeth of a gear wheel are recessed below the dedendum circle so that each tooth is in effect supported on a long beam so that the additional resilience thereby obtained provides sufficient ductility to resist breakage of the teeth under high torque loads, the gear preferably being formed as two mouldings which are secured together, and the mouldings incorporating abutments to limit the relative movement of the teeth.

3,611,825
DRIVING DEVICE FOR CHAINS
Elis Kallaes, Orsa, Sweden, assignor to Seasafe Transport AB, Stockholm, Sweden
Filed Nov. 3, 1969, Ser. No. 873,420
Claims priority, application Sweden, Nov. 5, 1968, 15598/68
Int. Cl. F16h *1/18, 19/06;* B66d *3/08*
U.S. Cl. 74—424.7 5 Claims



Hoisting or stretching device for chains provided with a guiding groove for the chain and a turnable worm screw in close connection to said groove and in engagement with one or more links of the chain so as to move the chain axially.

3,611,826
MANEUVER CONTROL SYSTEMS FOR CYCLOIDAL PROPELLERS
William E. Fisher, and John A. H. Morrison, both of Glendora, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.
Division of Ser. No. 721,307, Apr. 15, 1968, Pat. No. 3,545,398.
Filed Feb. 6, 1970, Ser. No. 9,863
Int. Cl. G05g *9/04*
U.S. Cl. 74—471 XY 4 Claims

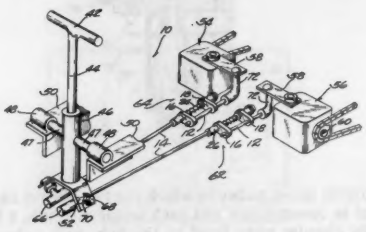


This disclosure relates to maneuver control systems for use with cycloidal propellers on marine vessels.

A control system according to the present disclosure includes control means located at each of a plurality of control stations. Control apparatus is associated with each control means to effectuate steerage and speed control of the propeller.

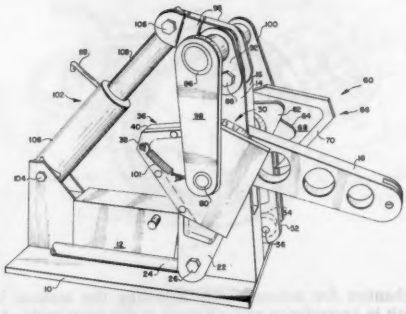
Optional and desirable features of the present disclosure include selector means for selecting one of the plurality of control stations to control the maneuvering of the vessel. Drive means may be associated with at least some of the control stations so that the control means at the noncontrolling stations follow the position of the control means at the controlling station. Preferably, the control means are lever arms which are capable of pivoting about each of two mutually perpendicular axes. Pivotal movement of the lever arm about one axis causes operation of speed control apparatus, while pivotal movement about the other axis causes operation of steering control apparatus.

3,611,827
FORCE LIMITED COUPLING
Robert O. Bottum, and Kirk W. Reimers, both of Lincoln, Nebr., assignors to Outboard Marine Corporation, Waukegan, Ill.
Continuation-in-part of application Ser. No. 821,214, May 2, 1969, now abandoned. This application Sept. 19, 1969, Ser. No. 859,254
Int. Cl. G05g *9/00*
U.S. Cl. 74—471 4 Claims



Disclosed herein is a hydrostatic drive unit controlled by a spring-loaded device which serves, in effect, as a mechanical safety valve preventing or limiting the buildup of undesirable or excessive pressure in the hydrostatic unit. Also disclosed herein is such a control device comprising a force-limiting coupling which connects the ends of a pair of parallel links or rods. When an axial force exerted in either direction on one of the links attains a predetermined force value, a spring yieldably affords overtravel or relative movement of one of the control links with respect to the other to prevent transmission of excessive forces.

3,611,828
CHANNEL-SWITCHING DEVICE
Max Maroshick, Glen Mills, Pa., assignor to The Boeing Company, Seattle, Wash.
Filed Sept. 30, 1969, Ser. No. 862,345
Int. Cl. G05g *1/00;* B64c *13/00, 13/32*
U.S. Cl. 74—479 11 Claims



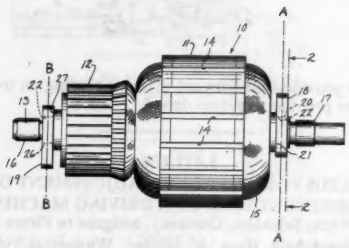
A channel-switching device is provided that receives two mechanical input signals and transmits one of these signals as an output signal. The device includes a primary input assembly that normally transmits a primary signal to an output member and a secondary input assembly that normally receives a secondary signal but does not transmit the secondary signal to the output member. The primary input assembly includes a normally engaged, cam-type positive drive clutch and the secondary input assembly includes a similar,

but normally disengaged clutch. Shift means are provided for simultaneously disengaging the clutch in the primary input assembly and engaging the clutch in the secondary input assembly after a failure in the primary input signal is sensed.

3,611,829
BALANCING ARRANGEMENT FOR ARMATURE ASSEMBLIES

Stephen E. Smith, Madison, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Feb. 9, 1970, Ser. No. 9,668
Int. Cl. F16f *15/22*
U.S. Cl. 74—573 **5 Claims**

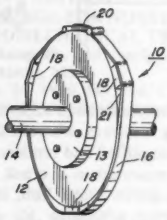


A counterweight preformed from sheet stock is secured to the shaft of an armature at a selected angle of unbalance and correction plane by a press fit between the shaft and a hole in the counterweight.

3,611,830
SILENCER BAND

Harry C. Shank, Lake Villa, Ill., assignor to Ammco Tools, Inc., North Chicago, Ill.

Filed Nov. 3, 1969, Ser. No. 873,176
Int. Cl. F16f *15/12*
U.S. Cl. 74—574 **3 Claims**



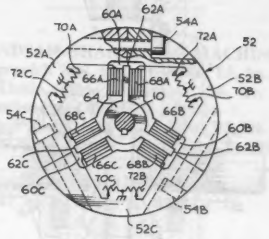
Device for dampening vibrations in a workpiece during a grinding operation performed thereon includes a plurality of lead blocks positionable directly against the workpiece and a spring-loaded flexible band for holding the blocks against the workpiece.

3,611,831
TORSIONAL VIBRATION DAMPER

Cormac Garrett O'Neill, Castro Valley, Calif., assignor to Physics International Company, San Leandro, Calif.

Filed Dec. 3, 1969, Ser. No. 881,714
Int. Cl. F16f *15/12*
U.S. Cl. 74—574 **7 Claims**

Apparatus for damping the torsional oscillations of a rotating shaft, is provided which includes an electromechanical transducer coupled to said shaft for converting a substantial portion of the mechanical energy generated by the torsional

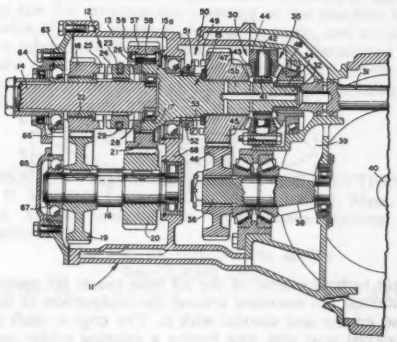


oscillations of the shaft to electrical energy which can then be readily dissipated by applying it to load resistors.

3,611,832
GEARED DRIVE MECHANISM

George W. Vollmer, Chardon, Ohio, assignor to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed June 8, 1970, Ser. No. 44,126
Int. Cl. F16h *37/08, 3/02*
U.S. Cl. 74—700 **13 Claims**



An axle-mounted auxiliary transmission in which the output gear, clutch output member, and output shaft are in the form of a fabricated subassembly which can be easily disassembled without removing it from the transmission housing.

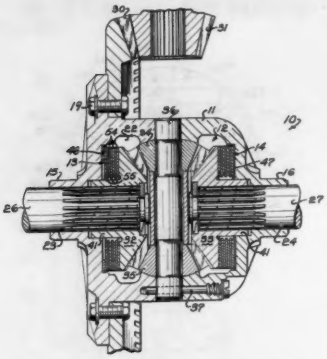
3,611,833
DIFFERENTIAL

Jerry F. Baremor, Detroit, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio

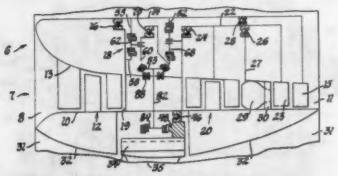
Continuation of application Ser. No. 705,476, Feb. 14, 1968, now abandoned. This application Feb. 26, 1970, Ser. No. 14,763
Int. Cl. F16h *1/44, 57/08*
U.S. Cl. 74—711 **1 Claim**

A limited slip differential includes at least a pair of pinion

gears having a meshing relationship with a pair of side gears. The meshing relationship of one of the pinion gears with one side gear is out of phase with the meshing relationship of another pinion gear with the one side gear.



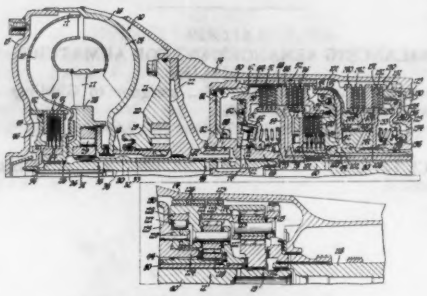
3,611,834
FAN DRIVE
James R. Dison, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 13, 1969, Ser. No. 865,573
Int. Cl. F16h *37/06*; F02k *3/02*
U.S. Cl. 74—720.5 **12 Claims**



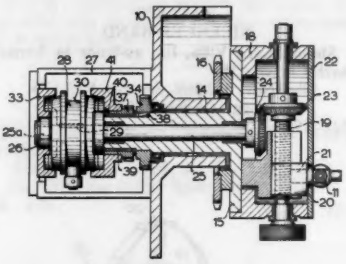
A gas turbine engine of the lift type exerts lift principally by a ducted fan mounted around the midportion of the gas turbine engine and coaxial with it. The engine shaft drives two coaxial gear sets, one having a rotating spider and the other a rotating ring gear, these rotating in opposite directions at the same speed. Each gear set drives a bevel gear coaxial with the turbine axis, these gears being coupled together by a thrust bearing. A substantial number of radial drive shafts extend across the motive fluid duct of the gas turbine, each bearing a bevel pinion meshing with both of the bevel gears. The outer ends of these shafts bear spur pinions which mesh with a circular rack-type gear external to the motive fluid duct and fixed to the hub of the fan. The fan is mounted on a large ball bearing on the exterior of the turbine casing.

3,611,835
TRANSMISSION
August H. Borman, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 28, 1969, Ser. No. 880,647
Int. Cl. F16h *57/10*, *47/08*
U.S. Cl. 74—759 **4 Claims**

A vehicle transmission having a hydrodynamic torque converter and two planetary gear sets combined with three clutches, a one-way clutch, three brakes and two one-way brakes to provide four forward drives including an overdrive and also to provide a reverse drive.



3,611,836
APPARATUS FOR AN ENDLESS ADJUSTMENT OF THE WORKING STROKE OF A DRIVING MACHINE
Werner Weck, Schwelm, Germany, assignor to Firma Hamba-Maschinenfabrik Hans A. Muller, Wuppertal-Vohwinkel, Germany
Filed Oct. 6, 1969, Ser. No. 863,901
Claims priority, application Germany, Oct. 7, 1968, P 18 01 599.1
Int. Cl. F16h *35/08*; G05g *1/00*
U.S. Cl. 74—837 **5 Claims**



An apparatus for continuous adjustment of the working stroke of a driving machine, wherein the adjustment of the working stroke is simplified and rendered easier. A stroke adjustment spindle, mounted in a crank ring which is rigidly connected with a driven crank hub, in addition to manual operation, is further adjustable by an adjustment drive, preferably by a bevel gear drive, movable selectively in one or in the other opposite rotary adjustment direction. This adjustment is brought about by sitting the driving or control wheel of this double gear drive at one end of a control shaft, projecting axially through the driven crank hub and likewise driven with the latter, which control shaft is coupled for a joint drive at its counter end and is as well axially slidable on the latter. The control shaft receives an engaging element operable from the outside by means of an engaging lever arrested in the rest position and manually operable, which engaging element, depending upon the amount of the stroke adjustment, cooperates either with a coupling ring disc immovable in space, preferably on the side of the coupling housing, and disposed with an axial distance, for instance, on the left side from the engaging element, in the sense of a rotary locking of the double gear drive control shaft, or is provided with a second coupling ring disc disposed with an axial

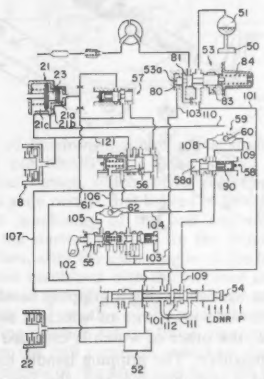
distance, for instance, on the right side from the engaging element, by means of an additional transmission drive driven from the crank hub with a peripheral speed higher than that of the crank hub in the sense of a bevel gear drive control shaft drive with its own driving speed surpassing the peripheral speed of the crank hub.

3,611,837

OIL PRESSURE CONTROL DEVICE FOR FLUID-TYPE AUTOMATIC TRANSMISSION SYSTEM

Sumio Uozumi, Toyota-shi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan

Filed July 25, 1969, Ser. No. 844,930
Claims priority, application Japan, July 31, 1968, 53587/43
Int. Cl. B60k *17/00*
U.S. Cl. 74—867 **2 Claims**



This invention relates to an oil pressure control device for fluid-type automatic transmission system having a torque converter and a speed-changing device controlled by servosystems. The servosystems are actuated by the pressure of two separate hydraulic circuits, the pressure of one circuit is set by a pressure control valve and the pressure of the other circuit varies with the position of the engine throttle valve.

3,611,838

HYDRAULIC CONTROL FOR NONSYNCHRONOUS SHIFTING HYDROMECHANICAL TRANSMISSION

Robert C. Utter, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 24, 1970, Ser. No. 13,319
Int. Cl. B60k *21/00;* **F16h** *47/04, 37/06*
U.S. Cl. 74—868 **8 Claims**

Fig.3	Fig.4
Fig.2	Fig.5
	Fig.6

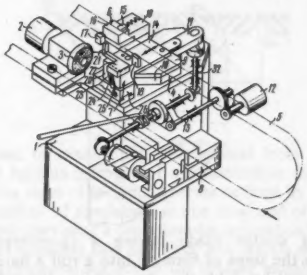
A transmission control for use with a hydraulic transmission for controlling pump displacement and mechanical gear ratio change in the transmission. The control has a ratio governor which directs displacement change signals to the hydrostatic pump and supplies a signal to a ratio shift signal valve which provides hysteresis. A shift signal valve, operatively connected with the pump, directs shift signals from the main pressure system to the ratio shift signal valve at predetermined pump displacements. The ratio shift signal valve directs the shift signals to shift valves to effect an up or downshift in the mechanical gear ratios. The control system also has a pressure regulator disposed between the main pressure supply and the ratio governor to control the stability of the pump control during operation of the transmission in the low drive range which regulator is effectively removed from the control system during operation in drive ranges other than low.

3,611,839

BANDSAW-SHARPENING MACHINE

Vladimir Viktorovich Idel, ulitsa Graftio, 15, kv. 6, and Jury Vasilievich Tishin, ulitsa Michurina, 26, kv. 12, both of Zavolzhie Gorkovskoi Oblasti, U.S.S.R.

Filed Mar. 24, 1970, Ser. No. 22,326
Claims priority, application U.S.S.R., Dec. 8, 1969, Jan. 12, 1970, 1378202;1387555
Int. Cl. B23d *63/12*
U.S. Cl. 76—37 **3 Claims**



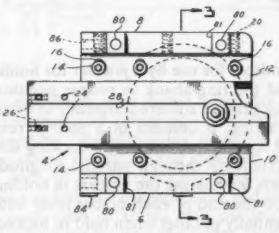
The invention relates to a bandsaw-sharpening machine comprising a rotating abrasive wheel, a mechanism for pitch feed of the saw with relation to the abrasive wheel, and a mechanism for working feed of the saw towards the abrasive wheel, said mechanisms being installed rotatably in the plane of the saw for ensuring the resetting of the machine to suit the value of the front tooth-sharpening angle, and a clamping device mounted with a provision for being transferred along the saw on the working feed mechanism for resetting the machine to suit the shape of the teeth of the saws being sharpened.

3,611,840

MOTION TRANSFER DEVICE CONSTRUCTION

John P. Mentink, Longmeadow, Mass.; John J. Mate, Fairfield, Conn., assignors to Hydromation Systems Inc., Westfield, Mass.

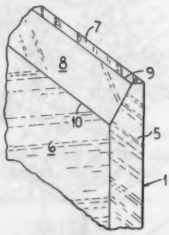
Filed June 16, 1970, Ser. No. 46,769
Int. Cl. F16h *25/08*
U.S. Cl. 74—55 **6 Claims**



Motion transfer device construction for precisely controlled high-speed linear output movement from a rotary drive input, having a housing on which an elongated tool

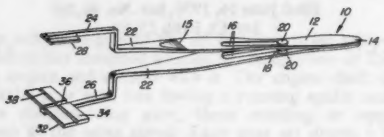
slide bar block is slidably carried in exposed relation to provide a plurality of tool mounting positions, the bar being formed with longitudinal tool locating grooves and supported between V-shaped bearing guide blocks extending the full length of one face of said housing. A housing throughbore provides stepped shouldered portions in which a stepped drive shaft unit is seated by spaced roller bearings, a closed track face groove cam at the inner end of the shaft being thereby positionally located for driving engagement with a follower roll of the slide bar.

3,611,841
METHOD OF PRODUCING A COATING DOCTOR
Karl Erik Holger Froden, and Hakan Arne Eriksson, both of Munkfors, Sweden, assignors to Uddeholms Aktiebolag, Uddeholm, Sweden
Filed Nov. 1, 1968, Ser. No. 772,624
Claims priority, application Sweden, Nov. 7, 1967, 15216/67
Int. Cl. B21k *21/00*
U.S. Cl. 76—101 R **2 Claims**



A coating doctor blade having a chamfered face is produced by the steps of forming into a roll a hardened and tempered metal band blank, edge-grinding the blank in the roll, winding off the blank, planing a chamfer surface on one side surface of the blank by moving the blank, in a single pass in the longitudinal direction of the blank, over a single hard metal bit thereby providing a chamfered surface free from scratches and grooves detrimental to the evenness of a coating spread by the resulting doctor blade, and dividing the so-chamfered blank into doctor blades of suitable lengths.

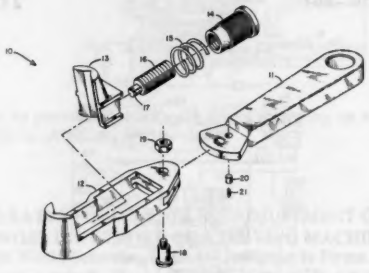
3,611,842
ORNAMENT HEAD AND SHANK ALIGNMENT AND HOLDING HANDTOOL
Clifton S. Skipper, P.O. Box 258, Chadburn, N.C.
Filed Oct. 20, 1969, Ser. No. 867,479
Int. Cl. B25b *9/02*
U.S. Cl. 81—43 **6 Claims**



This is a handtool for use by a jeweler for holding the ornament head and the ring shank in proper position while they are being unsoldered or soldered together in disassembling or reassembling a ring. It consists of a pair of resilient pincer levers secured together at one end, a locking double-headed pin slidably extending through parallel longitudinal slots in the pincer levers for holding the pincers in holding position, a stepped arm on the end of each pincer lever with fingers extending substantially parallel when held in locked position by sliding the double-headed pin toward the stepped arm ends, and confronting plates on the inside arm ends, at least one of the confronting faces of the plates having a longitudinally extending groove in which the ring shank is held with the ringhead held thereagainst by the face of the other plate.

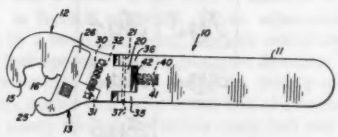
In addition, an all purpose soldering block of hard asbestos or hard "transite" is provided as an attachment for the tool, the block having a groove for the shank, and also an ear receiving recess and aligned groove for receiving an ear bob and its post while being soldered together into a pierced earring.

3,611,843
ADJUSTABLE SOCKET WRENCH
Joachim E. Engel, 10348 York Lane, Bloomington, Minn.
Filed Sept. 17, 1969, Ser. No. 858,582
Int. Cl. B25b *13/18*
U.S. Cl. 81—128 **5 Claims**



A cam action wrench having a gripping handle and a pair of relatively movable jaws, one of which is secured to the gripping handle, the other of which is cammed into engagement with its neighbor. The gripping handle has a hand-engaging end and a jaw-engaging end, the jaw-engaging end being adapted to receive a jaw member capable of cammed motion relative to and toward the other jaw. The handle is provided with a coarse adjusting member which is coupled to an axially movable jaw, a coupling being utilized to establish the coarse adjustment between the axially movable jaw and the coarse adjusting member. The stationary jaw is preferably provided with a through-bore for receiving the free end of a threaded member upon which a nut is being turned.

3,611,844
OPEN END RATCHETING WRENCH
Herman A. Myers, Lake Lynn, Pa., assignor to Insta-Snap, Inc., Monongahela, Pa.
Filed Mar. 17, 1970, Ser. No. 20,354
Int. Cl. B25b *13/12*
U.S. Cl. 81—129 **5 Claims**

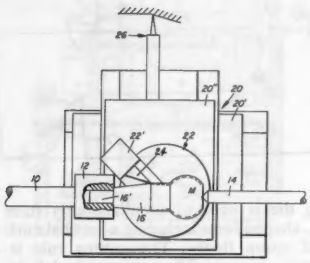


An open end ratcheting wrench having a breakaway handle and a rigid jaw secured thereto, the rigid jaw having two outwardly extended curved lugs and a recess to slidably receive a movable jaw. The movable jaw, which is slidably positioned in the recess of the rigid jaw, has an outwardly extending curved lug. A spring means positioned between the movable jaw and the rigid jaw urges the jaws together. The three lugs grip a fastening means to permit turning thereof and a reverse turning movement causes ratcheting.

3,611,845
METHOD OF MAKING BALL JOINTS

Hubert Weidner, 4991 Dielingen Haus near 78, Germany

Filed Aug. 29, 1969, Ser. No. 854,159
Claims priority, application Germany, Sept. 3, 1968, P 17 77 084.2
Int. Cl. B23b *1/00*
U.S. Cl. 82—1 C 2 Claims

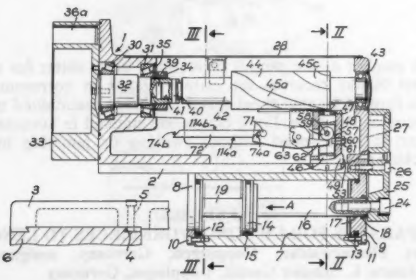


A method of finishing machining the shaft neck portion and the ball pin blanks on a lathe having a ball turner, wherein the ball turner, which carries the turning tool and is disposed on a slide rest, is first locked in the starting position for the finish machining of the ball and the slide rest is brought into the starting position for the finish machining of the neck portion, after the clamping in of the blank, the neck portion is finish machined with the advance of the slide rest under the control of a first control device, and the slide rest is locked in this end position of the tool, which is at the same time the starting position for the finish machining of the ball, and thereupon the ball turner is unlocked, the ball is finish machined by means of the same tool but with the advance of the ball turner controlled by a second control device, and finally the ball turner and slide rest are returned to their starting position so that the workpiece can be unclamped.

3,611,846
TOOL-CARRYING TURRET FOR AUTOMATIC CYCLE LATHE

Jules Louis Jeanneret, 13 a 21, rue Henri Gelin, 79 Niort, (Deux-Sevres), France

Filed Sept. 23, 1969, Ser. No. 860,328
Claims priority, application France, Sept. 27, 1968, 168,070
Int. Cl. B23b *21/00*
U.S. Cl. 82—21 A 7 Claims

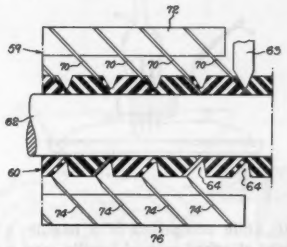


A tool-carrying turret for an automatic lathe is hydraulically actuated by the program of the lathe to index between successive working positions a tool-carrying plate. A locking bar serves in cooperation with one of a plurality of recesses in the plate to lock the plate at each working position. The indexing movement is both rotary and longitudinal relatively the axis of the tool-carrying plate, the longitudinal movement serving to withdraw each tool from the region of the workpiece at the completion of a machining operation and to bring the next tool to the working position relative to the workpiece.

3,611,847
METHOD OF MAKING A SEAL FOR RELATIVELY ROTATABLE PARTS

Karl Gustav Einer Derman, Savedalen, and Sven-Erik Malmstrom, Reftele, both of Sweden, assignors to Forsheda Gummifabrik Aktiebolag, Forsheda, Sweden

Division of Ser. No. 543,155, Apr. 18, 1966, abandoned, Continuation of Ser. No. 195,137 May 16, 1962, abandoned, Continuation-in-part of Ser. No. 72,741, Nov. 30, 1960, abandoned. Filed Feb. 6, 1968, Ser. No. 703,335
Int. Cl. B23b *1/00*; B29d *7/16*
U.S. Cl. 82—47 5 Claims

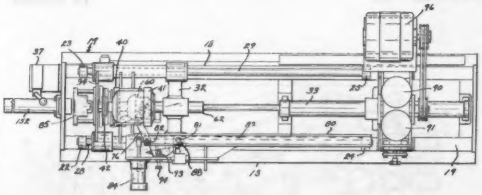


A method of making an annular seal from a generally cylindrical tubular member of an elastomeric material consisting of the steps of forming a recess defined by an inwardly directed surface of revolution at one axial end of the tubular member and providing a deep annular separation in the tubular member adjacent said one axial end which extends from the outer peripheral surface of the tubular member inwardly to and terminating at a point adjacent to but short of the inner peripheral surface to provide a thin flexible sealing lip at one axial end between the annular separation and the surface of revolution whereby the mass of the body portion is at least twice the mass of the flexible sealing lip.

3,611,848
TUBE-CUTTING MACHINE

Homer W. Sullivan, Gates Mills, and Colin V. Gegg, Lakewood, both of Ohio, assignors to The Hill Acme Company, Cleveland, Ohio

Filed June 26, 1969, Ser. No. 836,821
Int. Cl. B23b *37/00*
U.S. Cl. 82—53.1 10 Claims



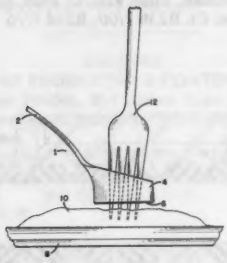
A rotary cutter flying tube cutoff apparatus for continuously and automatically severing elongated stock into preselected lengths. The apparatus includes a rotary-type cutter encompassing the stock and mounted for reciprocation along a path of travel extending longitudinally of the stock. The stock is fed into the apparatus and into the rotary cutter along such path of travel at a predetermined rate. Means are provided for moving the rotary cutter along with the stock at said predetermined rate and for actuating the rotary cutter while the stock and cutter are moving. Adjusting devices are provided to cut the stock to any suitable preselected length and to cut stock of a wide range of diameters. The rotary cutter effects an exceptionally clean cut free of burrs and jagged edges.

3,611,849

EATING UTENSIL FOR STRINGLIKE FOODS

Joseph Domonkos, 1509 Grove Ave., Windber, Pa.

Filed July 10, 1969, Ser. No. 840,786
Int. Cl. B26b 27/00
U.S. Cl. 83—23 3 Claims



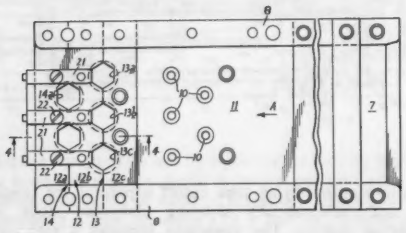
A spaghetti knife comprised of a handle, a hollow oval cutting element attached to said handle, and a cutting edge positioned on the portion of the cutting element. The spaghetti knife is used in conjunction with a conventional fork for the eating of spaghetti or other stringlike foods. The knife is held over a plate of spaghetti, the fork placed through the hollow cutting element into the spaghetti and twisted in the usual manner. The spaghetti rolled onto the twisted fork is limited in diameter by the diameter of the cutting element and formed into a neat circular roll, which may be easily inserted into the mouth. When this roll of spaghetti is the appropriate size, the spaghetti knife is pressed downward against the plate upon which the spaghetti is resting, thus cutting the extraneous strings of spaghetti and forming a cylindrical roll of spaghetti. The fork is then withdrawn from the cutting element together with the roll of spaghetti and inserted in the mouth.

3,611,850

MANUFACTURE OF HEXAGONAL SLUGS

James Reed Elliott, Bedford, and Eric Thomas Edward Turner, St. Albans, both of England, assignors to John Dale (Foundries) Limited, St. Albans, England

Filed July 23, 1969, Ser. No. 843,958
Claims priority, application Great Britain, July 26, 1968, 35925/68
Int. Cl. B26f 1/02
U.S. Cl. 83—43 10 Claims



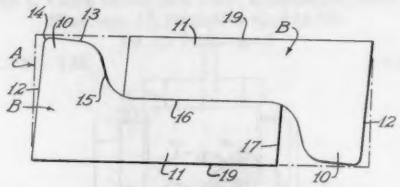
Hexagonal slugs are cut from a strip or sheet of metal by feeding the strip or sheet step by step between punches and dies which are arranged in two lines across the strip or sheet. The punches and dies in the second line are staggered midway between those in the first line, and the whole of the strip or sheet between the sidemost punches is cut without waste into slugs. Yielding support for the strip is preferably provided within the dies of the second line, preferably by making these dies retain one or more slugs within them.

3,611,851

METHOD OF MAKING CURB SEPARATORS

Roger L. Lingofelt, St. Paul, Minn., assignor to North Central Supply Company, Ramsey County, Minn.

Filed Aug. 7, 1969, Ser. No. 848,217
Int. Cl. B26f 1/44
U.S. Cl. 83—55 5 Claims



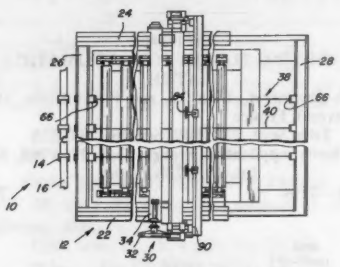
A cutting die is used to simultaneously form two curb spacers of L-shaped form including a vertical curb flange and a horizontal apron flange. The cutting rule is confirmed within a rectangular area. The cutting rule defining the upper surfaces of one horizontal flange forms the upper surface of a similar spacer in inverted relation to the first, and the ends of the cutting rule define the vertical flanges of both separators. The opposite sides of the die are unconfined so that when a rectangular blank is cut on the die, the two separators may move apart, the opposite longitudinal edges of the die forming the bottom surfaces of the spacers.

3,611,852

SLITTER AND STACKER FOR SHEET METAL BLANKS

David A. Strilich, Hobart, Ind., assignor to Gary Steel Products Corp., Gary, Ind.

Filed Mar. 19, 1970, Ser. No. 20,908
Int. Cl. B65h 29/52
U.S. Cl. 83—89 5 Claims



A stacker at the output of a rotary knife slitter for sheet metal blanks receives the output blanks in corresponding slots formed by thin sheet metal partitions maintained under tension at the ends. Long blanks are stacked in accurate register at high speed without twisting or jamming in the stacking slots.

3,611,853

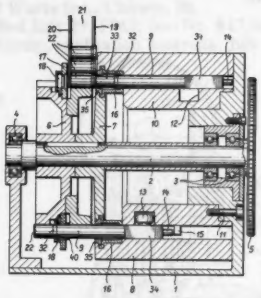
APPARATUS FOR CUTTING WORKPIECES TO LENGTH

Kurt Finsterwalder, Goppingen, Germany, assignor to Messrs. L. Schuler GmbH, Goppingen, Germany

Filed July 22, 1969, Ser. No. 843,567
Claims priority, application Germany, July 25, 1968, P 17 79 268.6
Int. Cl. B23d 21/04
U.S. Cl. 83—126 5 Claims

Apparatus for trimming to length deep drawn or extruded workpieces has a rotating transport member in the form of a hollow cylinder having a series of workpiece holders formed around its periphery at one end, the cylinder supporting for axial movement a ring of parallel punches associated one with each workpiece holder, the punches each being first projected forward in succession to engage a workpiece

loaded into the associated workpiece holder at a loading station and to cooperate with a die so as to trim the workpiece, and then being retracted, by means of cam followers attached to the punches and engaging a camming slot formed in a stationary drum mounted within the hollow cylinder, the



workpiece being stripped from the punch during its retractive movement. An ejector bolt is provided in a bore within each punch to commence the stripping operation at the commencement of the retractive movement.

3,611,854

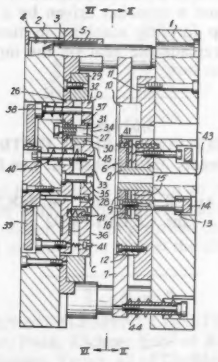
COMPOUND DIE FOR PUNCHING TWO CONCENTRICALLY SHAPED SHEET CIRCULAR MEMBERS FROM STRAP MATERIAL IN PUNCH PRESSES WITH VERTICAL DISPOSITION OF BLANKING PLANES

Vitaly Konstantinovich Gilev, 811 proezd, 65, kv. 16; Volf Nakhimovich Evzljn, ulitsa Chapaeva, 102, kv. 53; Gennady Nikolaevich Kamalov, prospekt Kirova, 30, kv. 57; Nadzhaf Ashdar Ogly Kuliev, ulitsa Aga-Neimatully, 20, kv. 1; Rafael Tevosovich Sarkisov, ultisa Aga-Neimatully, 20a, blok3, kv. 28, and Ernst Arakelovich Stepanian, ulitsa Durzhby Molodezhi, 2, kv. 36, all of Baku, U.S.S.R.

Filed Oct. 30, 1969, Ser. No. 872,528

Int. Cl. B26f *1/44, 1/14*

U.S. Cl. 83—132 **2 Claims**



A compound die is disclosed for punching concentrically shaped circular sheet members from a strap material in punch presses with a vertical disposition of the blanking planes. The die is provided with a lifter for removing the circular members whose surface, directly contacting the latter, is inclined, while the lifter of the strap is provided with guide chutes having spring-loaded clamps for pressing the strap against the face of the female die as well as for pressing the same against one of the chutes. In addition, the female die, the lifter for removing the circular member, the lifter for removing the central portion, which is a blank of a second member, and the internal punching ring are provided with means for separation of the circular member and its central portion from the surfaces of the punches, female die and the lifters as well as for keeping the central portion in place for a time during the opening of the die.

3,611,855

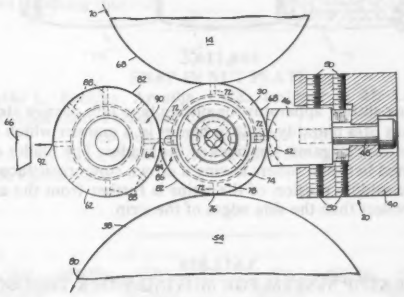
CUTTING APPARATUS

John William Thousand, Jr., Crestwood, Mo., assignor to St. Regis Paper Company, New York, N.Y.

Filed Jan. 22, 1970, Ser. No. 4,875

Int. Cl. B23d *25/08*

U.S. Cl. 83—100 **14 Claims**



Cutting apparatus for cutting a blank from a web of sheet material characterized by a knife roll having a knife engraved on the surface thereof and a mating fixed knife cutting bar having a concave portion where the knife engages same and having a longitudinal configuration so that the web is cut in a shearlike action.

3,611,856

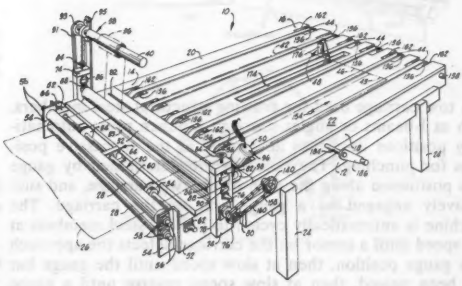
WEB CUTTER

Larry L. Adair, 611 W. 3rd, Edmond, Okla.

Filed Oct. 10, 1969, Ser. No. 865,262

Int. Cl. B26d *5/20*

U.S. Cl. 83—107 **10 Claims**



A web cutter adapted to automatically cut a web of material into web portions, each web portion having a predetermined length and width, and simultaneously adapted to cut strip portions, each strip portion having a predetermined width.

3,611,857

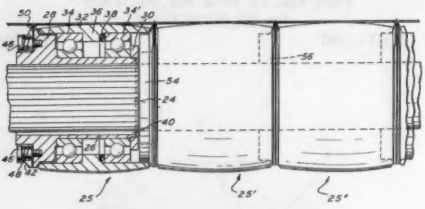
GANG SLITTING APPARATUS

Edward Zychal, Cornwells Heights, Pa., assignor to Zyco Manufacturing, Inc., Cornwells Heights, Pa.

Continuation-in-part of application Ser. No. 774,720, Nov. 12, 1968, now Patent No. 3,545,322. This application Aug. 13, 1970, Ser. No. 63,377

Int. Cl. B26d 1/46

U.S. Cl. 83—145 11 Claims



A gang slitting apparatus for slitting tape into narrow strips by means of a plurality of strip blades in a manner which relieves pressure against the sides of the blades. The blades are positioned between rollers having a crown support surface so that the middle portion of the strips is further from the axis of the rollers than the side edges of the strip.

3,611,858

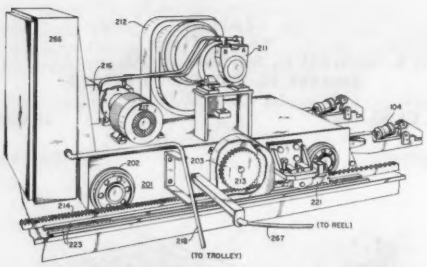
GAUGE STOP SYSTEM FOR MOVING WORK THROUGH PUNCH PRESS

William C. Beatty, Munster, and Milton G. Mock, Hobart, both of Ind., assignors to Beatty Machine & Manufacturing Co., Hammond, Ind.

Filed Jan. 27, 1970, Ser. No. 6,109

Int. Cl. B26d 5/20; B65h 9/10, 9/14

U.S. Cl. 83—220 11 Claims



A tow carriage used for drawing structural steel members, such as I-beams or angles, through a punch press automatically positions its pieces accurately at the successive positions for punching. The positions are determined by gauge bars positioned along the path of the two carriage, and successively engaged by a gauge arm on the carriage. The machine is automatically cycled to pull its steel members at full speed until a sensor on the carriage detects the approach to a gauge position, then at slow speed until the gauge bar has been passed, then at slow speed reverse until a gauge face on the gauge arm, which drops to gauging level upon passing the gauge bar, firmly engages the gauge face of the bar without wear. The reverse driving force is reduced to a holding value, and the punch operates. Then the full speed forward drive of the carriage starts a new cycle. This is repeated until the punching has been completed at the last gauge bar. The successive steps of cycling are mostly triggered by limit switches.

3,611,859

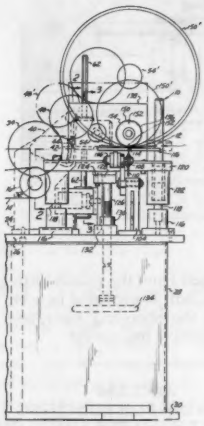
ADJUSTABLE ZIGZAG FIN STRIP MEASURING AND CUTOFF MACHINE

Hrant J. Avakian, San Francisco, Calif., assignor to Liberty Radiator Core Mfg. Co., San Francisco, Calif.

Filed Jan. 6, 1970, Ser. No. 878

Int. Cl. B26d 5/20

U.S. Cl. 83—240 10 Claims



Mounted on a baseplate is a rotary cam which rocks a lever pivoted on the baseplate and carrying a compressed air motor and cutter disc on its opposite end. Movable vertically on three guide posts rising from the baseplate is a platform supporting a power-dividing gear box, the input shaft of which carries a removable input change gear, whereas one of its two outposts operates a parallel index cam drive unit, the output shaft of which carries a toothed counting and indexing wheel adapted to engage the convolutions of a zigzag louvered metal fin strip moving along a shaft containing a slot through which the cutter disc can move upward to sever the fin strip. The second output shaft of the power-dividing gear box 60 rotates a vertical spline shaft continuously and the spline shaft in turn drives the cutter operating cam. A train of gears, the uppermost of which is mounted on a swinging arm, conveys power from a sprocket driven by a sprocket chain from the fin strip forming machine in timed relationship therewith to the replaceable gear on the input shaft of the power-dividing gear box.

3,611,860

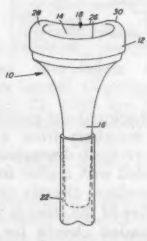
MOUTHPIECE FOR MUSICAL INSTRUMENTS

Lawrence B. Tichenor, 3505 Robert E. Lee Place, Apt. 204, Alexandria, Va.

Filed Aug. 8, 1969, Ser. No. 848,525

Int. Cl. G01d 9/02

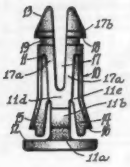
U.S. Cl. 84—398 1 Claim



A mouthpiece for brass musical instruments is disclosed wherein the open end of the mouthpiece is curved to conform with the shape of the user's mouth. The open end of the

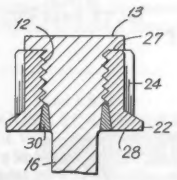
mouthpiece is generally concave as viewed from the side, and is elliptical as viewed from the end. The shape of the mouthpiece cavity is generally ellipsoid.

3,611,861
MOUNTING CLIPS OR FASTENERS
Karl Peter Schulze, Carrum, Victoria, Australia, assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed July 29, 1969, Ser. No. 847,003
Claims priority, application Australia, July 31, 1968, 41478/68
Int. Cl. F16b *19/00*
U.S. Cl. 85—5 **5 Claims**



The invention is in an improved mounting clip or fastener for conveniently and quickly securing apertured members together. The clip or fastener has a headed shank or body adapted to be inserted into apertured members, said shank having shouldered resilient arms adapted to engage inner and outer apertured members into which the clip has been inserted to prevent retraction of the clip from the apertured members.

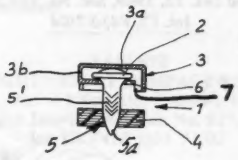
3,611,862
BOLT AND METHOD OF MAKING SAME
Richard A. Walker, Warrington, Pa., assignor to Standard Pressed Steel Co., Jenkintown, Pa.
Continuation-in-part of application Ser. No. 692,141, Dec. 20, 1967, now abandoned. This application Oct. 6, 1969, Ser. No. 871,450
Int. Cl. B21k *1/44*; **F16b** *23/00, 35/00*
U.S. Cl. 85—9 R **13 Claims**



A bolt formed by turning a nut onto an externally threaded section of a stud which is spaced from an end of the stud by an abutment shoulder. The nut is turned onto the stud so that one end face of the nut bears against the abutment shoulder.

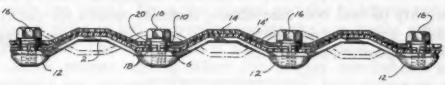
3,611,863
FASTENING ELEMENT CONSTRUCTION
Wolfgang Bayer, Pona, Eschen; Konrad Kostlin, Vaduz, and Wilfried Imelmann, Vaduz, all of Liechtenstein, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein
Filed June 9, 1969, Ser. No. 831,350
Claims priority, application Germany, June 24, 1968, P 17 50 989.6
Int. Cl. F16b *15/02*
U.S. Cl. 85—10 E **2 Claims**

A fastening element such as a bolt, nail or similar device which is adapted to be driven into a hard receiving material such as steel or concrete includes a member having a shank portion with a pointed end and a head portion which is enclosed by a cap made of a stainless metal or rust-resistant metal. In addition, a washer or disk of ductile plastic material is arranged to surround a portion of the shank of the fastening element. The cap includes tabs which grip under the head



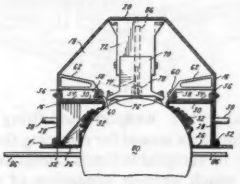
portion and side portions which are adapted to bear into the ductile plastic when the fastening element is driven into the hard receiving material.

3,611,864
SNAP-IN NUT PLATE
David L. Buckley, Arcadia, Calif., assignor to Air Logistics Corporation, Pasadena, Calif.
Filed Aug. 7, 1969, Ser. No. 848,233
Int. Cl. A44b *17/00*; **F16b** *13/04, 37/04*
U.S. Cl. 85—80 **7 Claims**



A replaceable multiple nut plate, for fastening corrugated or waffle-patterned sheets together, having a plurality of threaded openings for alignment with holes of the sheets and adapted for receiving threaded bolts from one side of the sheets. The nut plate has annular walls, protruding above the openings thereof, for snapping into the holes of the sheets and for allowing the bolts to be screwed into the nut plate without the need for restraining tools.

3,611,865
AIRCRAFT MOUNT FOR WEAPONS AND OTHER STORES
Joseph M. Schallert, Bridgeton, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Feb. 5, 1969, Ser. No. 796,733
Int. Cl. F41f *5/02*
U.S. Cl. 89—1.5 R **12 Claims**

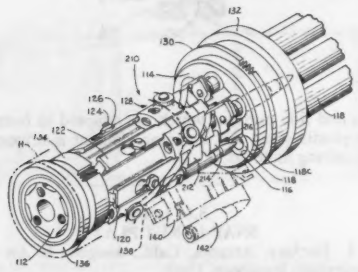


A mount for securing weapons and other stores to an aircraft and including a housing projecting into the aircraft, an ejector rack on the housing for securing a load partially within the housing, and an inflatable seal which engages the load and conforms to its contours. When the load is detached from the rack the seal extends across the cavity formed by the housing and is generally flush with the exterior surface of the aircraft so that an uninterrupted moldline exists.

3,611,866
BOLT ASSEMBLY

Charles C. Jacolucci, Richmond, and Gordon H. Woodford, Essex Center, both of Vt., assignors to General Electric Company

Filed Oct. 22, 1969, Ser. No. 868,379
Int. Cl. F41d 7/04
U.S. Cl. 89—12 5 Claims

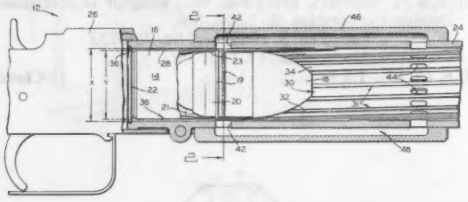


A bolt assembly for a Gatling gun, which gun has a stationary housing with the conventional elliptical cam track; a rotor assembly a plurality of barrels, adapted to receive a like plurality of said bolt assemblies; includes means for cocking, searing and reseting the firing pin responsive to the longitudinal disposition of the bolt.

3,611,867
EMERGENCY WEAPON FOR FIRING HIGH-VELOCITY GRENADE ROUNDS

Stanley D. Silsby, Granby, Mass., assignor to The United States of America as represented by the Secretary of the Army

Continuation-in-part of application Ser. No. 776,953, Nov. 19, 1968, now abandoned. This application Nov. 3, 1969, Ser. No. 873,426
Int. Cl. F41c 21/12; F41f 17/00
U.S. Cl. 89—14 R 5 Claims

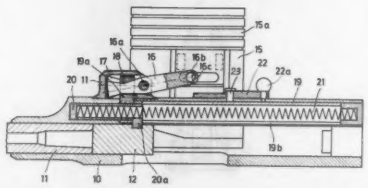


A shoulder-supported weapon for firing high-velocity grenade rounds includes means for reducing the high-velocity and recoil forces to acceptable limits comprising an oversize barrel chamber which permits expansion of the case upon discharge of the round and immediate escape of the discharge gas between the case and projectile during initial acceleration of the projectile into flight. The escaping gas is vented from the chamber into a canister around the barrel and then back through a second set of ports into the barrel bore forwardly of the projectile. The gas escape system is closed when the projectile passes the second set of ports and the remaining trapped gas is used to propel the projectile from the barrel.

3,611,868
AUTOMATIC FIREARM WITH TWO SELECTIVELY EMPLOYABLE CARTRIDGE FEED DEVICES

Gerhard Hupp, Oberndorf, Neckar, Germany, assignor to Mauser-Werke A. G., Oberndorf/Neckar, Germany

Filed May 7, 1969, Ser. No. 822,514
Claims priority, application Germany, May 10, 1968, P 17 03 379.3
Int. Cl. F41d 9/02
U.S. Cl. 89—33 SF 4 Claims

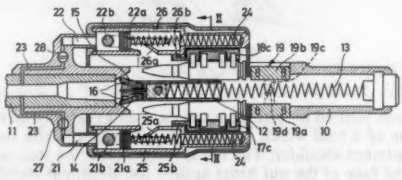


An automatic firearm, such as a rifle, is provided with a forwardly and rearwardly movable breech block and an upper and a lower employable cartridge feed device for selectively firing different types of cartridges, such as blasting cartridges and armor-piercing cartridges. The cartridges in both feed devices are fed in the directional sense and the drive and changeover elements of the two cartridge feed devices are arranged between the two feed housings.

3,611,869
AUTOMATIC FIREARM WITH A CHANGEOVER CARTRIDGE FEED DEVICE

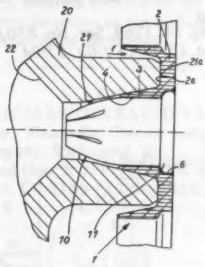
Gerhard Hupp, Oberndorf, Neckar, Germany, assignor to Mauser-Werke A.G., Oberndorf, Germany

Filed May 7, 1969, Ser. No. 822,513
Claims priority, application Germany, May 10, 1968, P 17 03 378.2
Int. Cl. F41d 9/02
U.S. Cl. 89—335 F 2 Claims



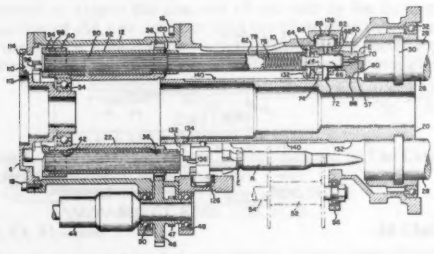
An automatic firearm, such as a rifle, is provided with a changeover cartridge feed device for firing selectively different types of cartridges, such as blasting cartridges and armor-piercing cartridges. The breech block is provided with cartridge feed channels, one for each type of cartridge used, and with respective cartridge strippers. The strippers are controlled by a control device the operating member of which consists of a longitudinally reciprocable slidable munition selector slide which when in a forwardly adjusted end position renders the feed device for one type of cartridge operative, while when the munition selector slide has been adjusted to a rear end position it renders the feed device for another type of cartridge operative.

3,611,870
CARTRIDGE MAGAZINE CONSTRUCTION
Karl-Ernst Udert, Triesen, and Hans Umbach, Stadeln, both of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein
Filed Dec. 26, 1968, Ser. No. 787,055
Claims priority, application Germany, Mar. 11, 1968, P 16 78 396.3
Int. Cl. F42d *39/08*
U.S. Cl. 89—35 9 Claims



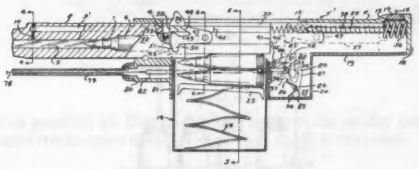
A cartridge magazine for holding cartridges for feeding to the barrel of an explosion-driven bolt-setting device comprises an elongated flat flexible band preferably made of an inexpensive material such as plastic. The band includes a plurality of generally cylindrical projections defining cartridge holding recesses arranged at equally spaced locations along the band and notches at each side of the band to facilitate its feeding. The recesses open on the top of the band and at the bottom and they are constructed with a widened base portion to hold the base portion of a cartridge therein flush to the exterior side. The upper portion of the recesses embraces the cartridge with a press fit in an area extending from one-third to two-thirds to the height of the cartridge. Each cartridge-holding recess is defined by a conical projection extending upwardly from the band which tapers on its exterior inwardly in a direction toward the tip of the cartridge. The angular taper of this portion of the cartridge magazine is slightly greater than the cone angle of the cartridge chamber of a gun barrel with which it is to be employed, so that the cartridge magazine with the cartridge will be moved out of the gun barrel when the gun barrel is moved forward after the explosion of the cartridge.

3,611,871
FIRING MECHANISM FOR HIGH RATE OF FIRE REVOLVING BATTERY GUN
Robert G. Kirpatrick, Shelburne, and Lincolon L. Sibley, Jr., South Burlington, both of Vt., assignors to General Electric Company
Filed Mar. 31, 1970, Ser. No. 24,199
Int. Cl. F41d *11/16*
U.S. Cl. 89—127 6 Claims



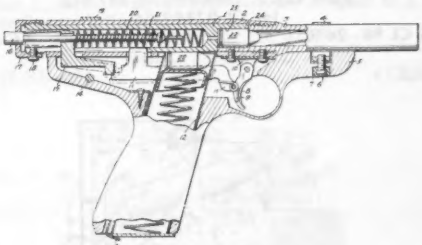
Firing mechanism for high rate of fire revolving battery gun providing a cam track in the aft end of the housing to provide locking and unlocking rotation to the bolt via a cam follower and telescoping linkage. Additionally, a positive lock is provided on the firing pin which is only released by rotation of the bolt into lock. Yet additionally, the cam track is adjustable to a safe disposition wherein rotation of the bolt into lock is precluded.

3,611,872
LIGHTWEIGHT COMPACT RIFLE
Dale M. Davis, Rte. # 1 Box 238, Freeport, Fla.
Filed June 2, 1969, Ser. No. 829,413
Int. Cl. F41d *5/04, 11/02*
U.S. Cl. 89—136 2 Claims



An automatic rifle of lightweight and extreme compactness is disclosed which is characterized by having no stock. The recoil is transmitted through the shooter's arm to the shoulder. The trigger and the handgrip are mounted at the muzzle end of the gun and are carried on a sleeve which surrounds the barrel. Thus, the trigger and the handgrip can be rotated, right or left, to accommodate the gun to the arms of the shooter. The front sight is also movable about the barrel to allow proper aiming when the trigger mechanism and handgrip are rotated. The reciprocatory bolt action is obtained by the use of propellant gases from a fired projectile, these gases being bled into a manifold which is connected to a dual-acting set of pistons for moving a slide member which carries the bolt action. A driving spring returns the bolt to press a new cartridge into firing position within the bore. The forward trigger is connected to the hammer and sear assembly through a pair of cables which pass about opposite sides of the cartridge magazine so as not to interfere with the automatic feeding of a live cartridge into the barrel when the bolt has moved to the rear.

3,611,873
BLOWBACK FIREARM WITH RETARDED EXTRACTION
Thormon O. Ellison, Box 163, Rte. 3, Aberdeen, Md.
Filed Mar. 21, 1969, Ser. No. 809,348
Int. Cl. F41c *5/00*
U.S. Cl. 89—180 2 Claims



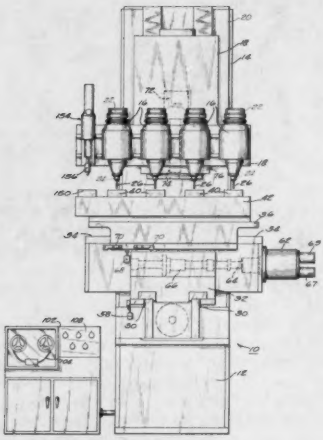
In an automatic weapon, blowback pressure extracts the spent, empty shell. In this invention the rate of extraction due to blowback is automatically retarded in proportion to the force of the explosion. This is advantageous for several reasons. For example, if the explosion, and resultant pressure, is abnormally high, the shell is held in place by a semilocked or retarded bolt. The bolt is automatically

released as the pressure drops. This action also assures that the maximum amount of energy will be imparted to the projectile, and that the shell will not be prematurely partially ejected with a blowout of the side of the shell.

3,611,874
COMBINED NUMERICAL AND TRACER CONTROL SYSTEM FOR MACHINE TOOLS

Charels A. Larsen, Union Grove; Harvey W. Zimmerman, Racine, and J. L. Dye, Racine, all of Wis., assignors to Gorton Machine Corporation, Racine, Wis.

Filed Feb. 5, 1970, Ser. No. 8,782
Int. Cl. B23c *1/16*; G05b *19/36*
U.S. Cl. 90—13 C 6 Claims

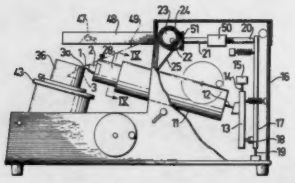


A control system for a machine tool having three mutually perpendicular axes along which elements of the machine tool are movable. The control system includes a numerical control for controlling movement of the machine tool elements along two of the axes. The control system further includes a tracer control operable by the numerical control for controlling the machine tool elements along the third axis of the tool.

3,611,875
APPARATUS FOR TRIMMING A SPECIMEN WHICH IS TO BE CUT IN A MICROTOME

Karl-Erik Wistedt, Jakobsberg; Bo Gosta Forsstrom, Skalby, and Karl Goran Algy Persson, Stockholm, all of Sweden, assignors to IKB-Producter AB, Bromma, Sweden

Filed Aug. 5, 1969, Ser. No. 847,543
Int. Cl. B23d *3/04*
U.S. Cl. 90—24 R 4 Claims

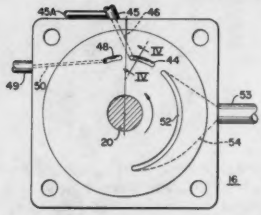


There is provided an apparatus in which a specimen containing an object embedded therein can be trimmed to a shape and size suitable for cutting in a microtome. The apparatus includes a specimen holder, a cutting means and means for causing relative movement between the cutter and the specimen. Means are found which enable the specimen holder to be turned so that any side of the specimen can be presented at will to the cutter, and means by which adjustment can be made to the relative position of cutter and specimen thereby to enable the specimen to be cut to a predetermined cross-sectional shape.

3,611,876
ULTRA HIGH-PRESSURE COMPRESSIBLE FLUID MOTOR

Luther F. Day, Hawthorne, Calif., assignor to Ferris Q. Day and Harvey E. Day

Filed Aug. 14, 1969, Ser. No. 850,084
Int. Cl. F01b *3/02*, *13/04*
U.S. Cl. 91—6.5 24 Claims

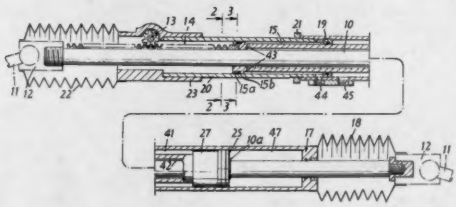


A motor utilizing a plurality of pistons reciprocating longitudinally in a rotating piston barrel is disclosed. Rotation is developed by the force of the pistons against an angled ramp plate. An apertured seal pad completes the bottoms of the cylinders and bears against a port ring having circumferentially disposed slots and ports specifically located therein to permit the transfer of the compressible fluid and an incompressible fluid to and from the individual cylinders at appropriate points in the operational cycle. A lubricating seal between each piston and its cylinder wall to contain the extremely high pressures at which the motor is adapted to operate is provided by a plurality of oil rings which are established automatically during the rotation of the piston barrel.

3,611,877
MOTORS

Michael Dávid Baxter, Rochester, England, assignor to Hobourn-Eaton Manufacturing Company, Ltd., Kent, England

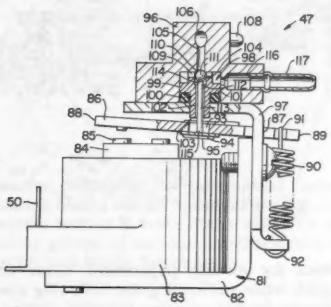
Filed Jan. 6, 1970, Ser. No. 954
Claims priority, application Great Britain, Jan. 6, 1969, 822/69
Int. Cl. F15b *9/10*, *15/17*
U.S. Cl. 91—376 11 Claims



A servomotor primarily for rack and pinion power steering comprises a piston rod extending through the end members

of a cylinder and carrying a piston assembly within the cylinder. An operating shaft encircling the piston rod extends through one end member and has at its end adjacent the piston assembly a valve member which cooperates with the piston assembly to control the motor. A spring urges the piston assembly and the valve member axially into a central portion of the valve but permits relative displacement of the piston assembly and valve member axially relative to each other. The valve member is arranged to control a supply of pressure fluid, in response to movement of the operating shaft to move the valve member in one direction or the other from said central position relative to the piston, to move the piston in the same direction as the initiating movement of the valve member relative to the piston.

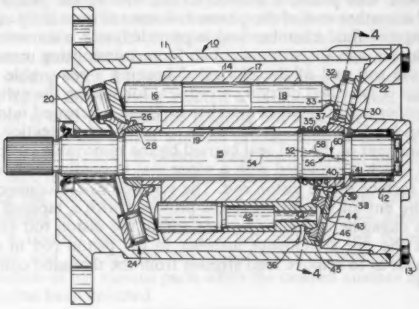
3,611,878
ELECTRICALLY OPERATED VALVE MEANS
Louis M. Puster, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Oct. 9, 1969, Ser. No. 865,041
Int. Cl. F15b *13/044*; F16k *31/06*
U.S. Cl. 91—459 **18 Claims**



A plurality of separate pneumatically operated actuators disposed in aligned and abutting relation to provide a linear positioning unit having opposed ends with each actuator being individually operable to linearly extend itself when actuated and thereafter to linearly collapse itself when deactuated whereby one end of the unit will be correspondingly linearly extended relative to the other end thereof and thereafter be linearly collapsed relative to the other end thereof. A control device being operatively interconnected to the one end of the positioning unit to be controlled in relation to the position of the one end relative to the other end thereof and electrically operated ball valve means including opposed valve seats and shock-absorbing spring means for directing a source of pneumatic fluid to at least one of the actuators to extend the one end of the unit by the degree of actuation of the one actuator and for thereafter disconnecting the source from that one actuator to collapse the one end of the unit by the degree of deactuation of the one actuator.

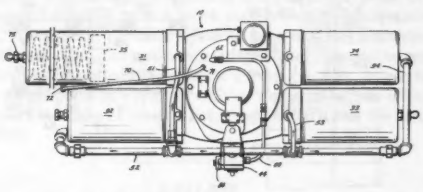
3,611,879
AXIAL PISTON DEVICE
Loren L. Alderson, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.
Filed May 18, 1970, Ser. No. 38,181
Int. Cl. F04b *1/10, 1/20*
U.S. Cl. 91—490 **14 Claims**

An axial piston barrel device having slipper shoe contacting an inclined or inclinable cam wherein a shoe-engaging cage or spider plate is positioned nonconcentrically to the slipper shoes, so that a shoe drivingly engages the spider plate only when moving while on the retraction portion of the cycle. One form of the invention offsets the center axis of the spider plate from the shoe axis toward the outermost



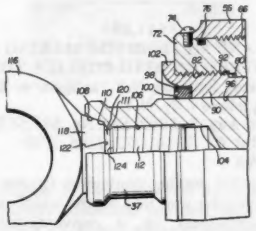
piston position so that each shoe engages the spider only on inward stroke even if rotation or cam angle is reversed.

3,611,880
OPERATOR AND METHOD OF LUBRICATION THEREOF
Ronald A. Gulick, Sugarland, Tex., assignor to Research Engineering Company, Houston, Tex.
Filed May 19, 1969, Ser. No. 825,628
Int. Cl. F16n *7/30*
U.S. Cl. 92—154 **6 Claims**



An operator using pneumatic means, such as air, for causing movement of a further member, such as rotation of a valve stem to open or close the valve, wherein the operating fluid, such as air, is prelubricated, as by mixing with oil, to continually lubricate the operator parts and/or their connections with such further member, and to combat corrosion.

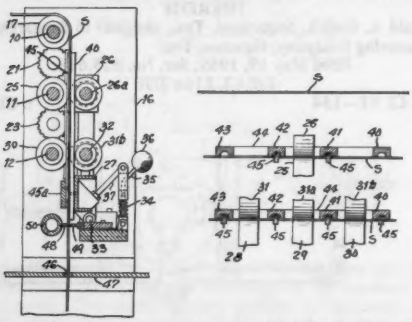
3,611,881
FLUID CYLINDER AND PISTON ASSEMBLY
William E. Little, West Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.
Filed Apr. 13, 1970, Ser. No. 027,792
Int. Cl. F16j *1/10*
U.S. Cl. 92—255 **4 Claims**



A fluid cylinder and piston assembly which comprises an elongated housing defining a fluid chamber to one end of

which is secured an attaching member having an eye for securement to a force absorbing member and a piston and piston rod contained in the fluid chamber for reciprocation therein. The piston is welded to one end of the piston rod and the other end of the piston rod extends outwardly of the elongated fluid chamber and is provided with a screw-in attachment eye for securement to force transmitting member. At the rod end of the elongated housing a removable cartridge is provided carrying a rod seal for sealing the cylinder chamber and a retainer member or gland is screwed into the cartridge from the outside of the cylinder for protection and retainment of the rod seal carried by the removable cartridge and which is provided with a wiper seal to continuously wipe the surface of the piston rod. The screwed-in eye connection at the end of the piston rod is provided with a tapered surface engaging a tapered surface within the piston rod end to lock the eye attachment member to the piston rod in such fashion as to remove load stresses from the threaded connection.

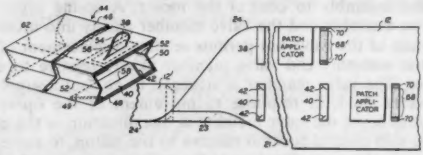
3,611,882
WEB-FEEDING MEANS AND METHOD
Andrew W. Anderson, West Caldwell, N.J., assignor to Scandia Packaging Machinery Company, North Arlington, N.J.
Filed May 14, 1969, Ser. No. 824,561
Int. Cl. B31b *1/10, 1/16;* **B31f** *7/00*
U.S. Cl. 93—1 G **14 Claims**



A method and an apparatus are provided for feeding a web of thin, flimsy material to a wrapping station located in a wrapping machine. A sheet of the thin, flimsy material is cut from the web after it has been fed to the wrapping station. During the feeding process, a continuous web of thin, flimsy material is moved along a path from a supply. While in the feeding process, continuous, longitudinal pleats are formed in the continuous web while it moves along said path. The pleats are effective to stiffen the material without causing a transverse stress therein, thereby enhancing its capacity to be fed to the wrapping station. The feeding assembly may be used in combination with a wrapping machine for wrapping packages with a thin, flimsy sheet of material. A more specific embodiment includes an assembly providing means for placing continuous, longitudinal pleats in a thin, flimsy web of material. In this specific embodiment, the web of material is fed vertically downwardly into the wrapping machine at which point sheets are cut from the end of the web for placement around a package.

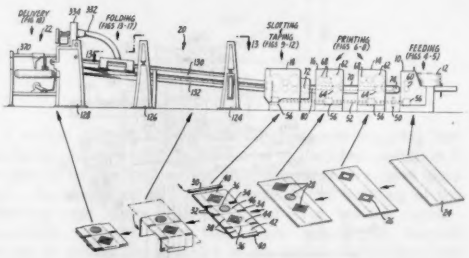
3,611,883
APPARATUS AND METHOD FOR MAKING BAGLIKE CONTAINERS WITH BOXLIKE TOP
William H. F. Grob, Babylon, N.Y., assignor to Equitable Bag Co. Inc., Long Island City, N.Y.
Filed Aug. 5, 1969, Ser. No. 847,563
Int. Cl. B31b *1/72, 1/86, 1/90*
U.S. Cl. 93—8 WA **11 Claims**

This apparatus for making containers applies patches to a web and then folds the web into a tube which is severed and formed into containers on a conventional bagmaking machine. The patches are located at the top of each "bag" and extend across the full width of the front and back of the bag and downwardly for a distance equal to the width of the sides of the bag so that the upper end of the container folds like a box to provide that style of container which has a bag bottom and a box top. The combining of the patch-applying



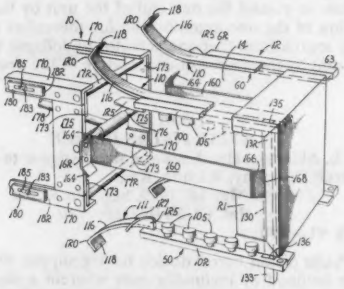
apparatus and the bagmaking machine produces superior containers at lower cost.

3,611,884
BOX MAKING MACHINE
William J. Hottendorf, Box 566, Sunnyvale, Calif.
Division of Ser. No. 627,041, Mar. 30, 1967.
Filed Jan. 26, 1970, Ser. No. 5,635
Int. Cl. B31b *1/22, 1/60, 1/88*
U.S. Cl. 93—36.9 **6 Claims**



Apparatus for moving paperboard boxes continuously along a path while performing the following operations on the box blanks: feeding, printing, creasing, slotting, trimming, taping, folding, and delivering. The apparatus may be adjusted for handling box blanks of different lengths and widths. Vacuum support means for the box blanks are provided in the feeding, printing and folding sections. The feeder may be operated to deliver box blanks to the path either continuously or periodically.

3,611,885
COMPRESSING APPARATUS FOR CONTAINER FORMING MACHINE
Gerald C. Paxton, Sanger, Calif., assignor to General Nailing Machine Corporation
Filed Jan. 20, 1970, Ser. No. 4,189
Int. Cl. B31b *1/44, 17/26, 17/60*
U.S. Cl. 93—36.3 **5 Claims**



An improved compressing apparatus for a container-forming machine providing a frame adapted to position a planar

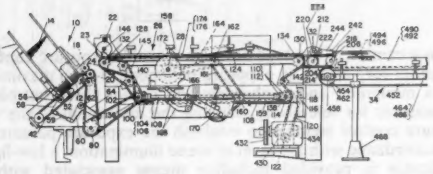
foldable container blank in a substantially planar assembly position with a pair of separate end panels disposed in substantially right-angular relation thereto and including coacting mandrel and die means on the frame operably concurrently to thrust the blank and the end panels through a substantially rectilinear path in a direction normal to the plane of the blank so as to fold the blank about the end panels in a container-forming position with the overlapping portions thereof providing at least one glued surface therebetween. The improvement of the present invention provides blank-compressing means mounted in fixed position on said die means in tightly pressing relation to said folded, overlapping portions of the blank and said end panels during said thrusting operation of the mandrel and die means.

3,611,886

APPARATUS FOR PRODUCING AND ACCUMULATING CARTONS

John W. Scully, Raynham, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Filed Apr. 21, 1969, Ser. No. 818,034
Int. Cl. B31b *1/64, 1/96, 1/06*
U.S. Cl. 93—36.3 **3 Claims**



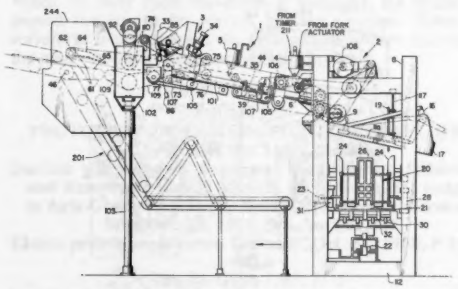
Apparatus for producing flat side-seamed cartons from prescored carton blanks and for accumulating successive cartons in a manner such as to make it convenient for an operator in handling groups of cartons for distribution to other machines or for packing for future use.

3,611,887

APPARATUS FOR FEEDING AND STACKING FOLDED PRINTED ARTICLES IN BUNDLES

Hajime Shibanuma, Ashiya, Hyogo, and Taneji Kishioka, Toyonaka, Osaka, both of Japan, assignors to Hamada Printing Press Mfg. Co., Ltd., Osaka, Japan

Continuation-in-part of application Ser. No. 585,649, Oct. 10, 1966, now abandoned. This application Aug. 21, 1969, Ser. No. 852,065
Int. Cl. B65h *33/03*
U.S. Cl. 93—93 C **14 Claims**



An apparatus for feeding and stacking printed articles such as folded newspapers in bundles. A printed article transfer conveyor has a detecting mechanism positioned above it comprised of a light projector and a light receiver. A bending device is provided in association with the conveyor for successively bending printed articles being conveyed. The detecting mechanism detects the shadow formed on an overlap portion between the folded bent portions of preceding and succeeding printed articles. A downwardly inclined opening and closing fork at the discharge end of the said transfer conveyor has comblike fork halves having adjacent ends opposed to each other with a small clearance therebetween and which are movable toward and away from each other a small distance along the plane of the downwardly inclined opening and closing fork. A rotatable basket is positioned beneath the fork halves for receiving a batch of articles therefrom, and a pusher is also provided for pushing out a bundle of printed articles from the basket wherein printed articles are stacked to form said bundle. A bottom sheet feeder and an identification card feeder are provided adjacent a roller conveyor onto which the bundles are pushed. An article-counting device is connected to the light receiver for counting articles detected and a control system is connected between the counting device and the rest of the apparatus for controlling the operation of the various parts when the desired number of articles has been counted.

3,611,888

METHOD OF SEALING EXPANSION JOINTS AND EXPANSION JOINT ASSEMBLY

John J. Kavalir, Two Mountains, Quebec, and Aron Nathan Rot, Laval, Quebec, both of Canada, assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 730,663, May 20, 1968.
Filed Dec. 19, 1969, Ser. No. 871,266
Int. Cl. E01c *11/10*
U.S. Cl. 94—18 **2 Claims**

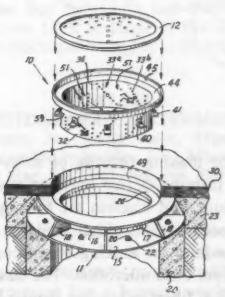
A composition of matter comprising (1) a block copolymer of the A–B–A type wherein the A's typically are polymeric blocks of styrene and B is a polymeric block of a conjugated diene or such a block copolymer in hydrogenated form, (2) asphalt, (3) a compatible resin and (4) plasticizer is disclosed. This composition is advantageously used in molten form to fill and seal a concrete expansion joint. In use the walls of the joint are primed with a "cement" which effects tenacious bonding of the sealant composition when the latter solidifies.

3,611,889

MANHOLE EXTENSION

Louis E. Levinson, Dallas, Tex., assignor to International Manufacturing Company, Garland, Tex.

Filed June 19, 1970, Ser. No. 47,654
Int. Cl. E02d *29/14*
U.S. Cl. 94—34 **5 Claims**

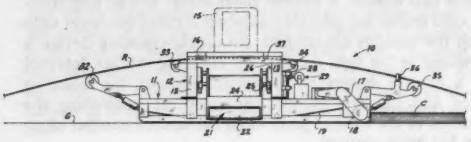


A manhole cover holder extension mountable in any one of several vertically adjustable positions in a manhole cover holder for holding a manhole cover in a raised position upon the raising of the top surface of a road by the adding of a top layer of asphalt or the like over the top surface of the original road.

3,611,890
METHOD OF AND APPARATUS FOR PLACING CONTINUOUS REINFORCING IN CONCRETE PAVING

Michael I. Hudis, Brookfield, Wis., assignor to Rex Chainbelt Inc., Milwaukee, Wis.

Filed Feb. 26, 1970, Ser. No. 14,547
Int. Cl. E01c 19/00
U.S. Cl. 94—39 22 Claims

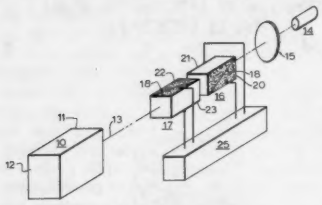


Continuous reinforcing rods are positioned on the grade to be paved and are lifted over a first machine which receives the concrete delivered alongside the grade and spreads the concrete under the rods and over the grade. Tie bars or crossbars are then placed on top of the concrete in such a manner as to be beneath the continuous reinforcing rods. The rods are then guided and depressed below the surface of the concrete by a second concrete-finishing machine and in turn depress the tie bars or crossbars to their proper position immediately therebeneath.

3,611,891
MESSAGE CHARACTER FORMING APPARATUS

Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif.

Filed Dec. 29, 1969, Ser. No. 888,402
Int. Cl. B41b 21/26
U.S. Cl. 95—4.5 3 Claims

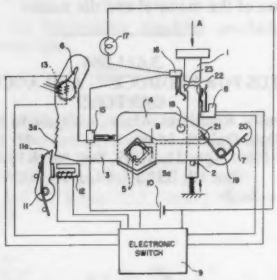


An apparatus for making records of message characters using a character forming device between a source of light and a record medium, and wherein the forming device lends itself to effecting recordations either while in direct contact with the record medium for making "hard copy" prints, or, through a lens system onto microfilm. The device makes use of a bundle of optical fibers extending from a light admitting surface to a light emitting surface of the device and wherein the fibers are divided into a number of smaller bundles, representing segments with which characters are formed. To form a particular character predetermined ones of the larger bundles are illuminated on the light admitting side of the device, and their corresponding segments will emit light in the form of the desired character on the opposite side, and from which a record is made.

3,611,892
DEVICE FOR INDICATING UNDEREXPOSURE IN PHOTOGRAPHIC CAMERAS WITH AUTOMATIC EXPOSURE CONTROL

Wolfgang Ort, Stuttgart-Bad, and Michael Reich, Altbach Kreis Eblingen, both of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 29, 1968, Ser. No. 771,448
Claims priority, application Germany, June 26, 1968, P 17 72 729.6
Int. Cl. G03b 7/08, 7/14, 9/06
U.S. Cl. 95—10 C 5 Claims

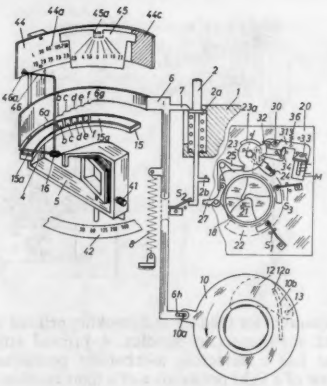


In a camera of the type having a movable exposure control member for varying an exposure parameter from a maximum to a minimum, and a photoelectric circuit that controls a transducer for selectively stopping the movement of the exposure control member to establish the exposure parameter in accordance with the level of scene illumination, a low-light indicator is provided including means associated with a movable shutter-release member for moving the exposure control member from its maximum exposure parameter position to its minimum exposure parameter position, and an electric signal means coupled with the photoelectric circuit for actuation immediately upon movement of the release member, when the scene illumination is below a predetermined level.

3,611,893
PHOTOGRAPHIC CAMERA WITH A SCANNING MECHANISM AND AN ELECTRONIC TIMING DEVICE

Franz W. R. Starp, Calmbach/Black Forest, Germany, assignor to Prontor-Werk, Alfred Gauthier G.m.b.H., Black Forest, Germany

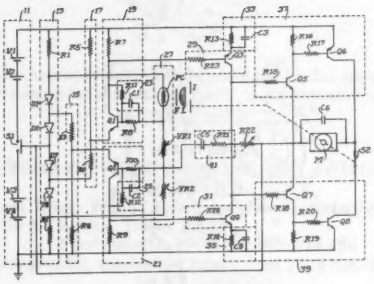
Filed Mar. 4, 1969, Ser. No. 804,209
Claims priority, application Austria, Mar. 5, 1968, A 2139/68
Int. Cl. G03b 7/12, 9/62
U.S. Cl. 95—10 C 10 Claims



A photographic camera is provided with a scanning mechanism and an electronic timing device which cooperate

with an exposure meter to permit automatic setting of exposure times and diaphragm aperture values.

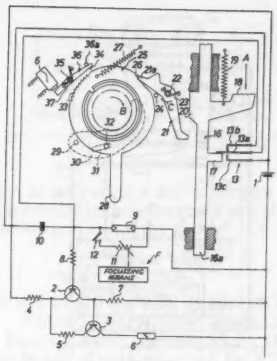
3,611,894
AUTOMATIC EXPOSURE CONTROL SYSTEM
Viktor Minneste, Jr., Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Apr. 22, 1969, Ser. No. 818,313
Int. Cl. G03b 7/10
U.S. Cl. 95—10 C **9 Claims**



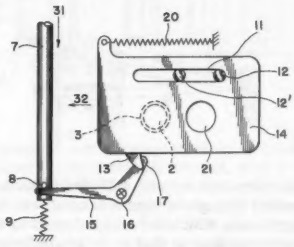
This disclosure describes an automatic exposure control system for controlling the iris of a camera. Power is applied through a stabilizing voltage string and voltage dividers, as well as from unregulated batteries through collector resistors, to preamplifiers. A photocell circuit that senses the amount of light passing through the iris is connected to the inputs of the preamplifiers. Signal shapers are connected to the preamplifiers to provide fast exposure correction without overshoot. The outputs from the preamplifiers are connected through stabilizer amplifiers and power amplifiers to a motor which controls the opening and closing of the iris. The stabilizer amplifiers may also be connected through a feedback circuit to the photocell circuit so that sustained oscillations are created and either a balanced or an unbalanced duty cycle waveform is imposed upon the reversible DC motor. When the duty cycle waveform is balanced, the motor has moved the iris to its correct balance position. When the waveform is unbalanced, the motor shaft rotates and moves the connected iris in the appropriate direction.

3,611,895
PHOTOGRAPHIC CAMERA FOR USE IN DAYLIGHT AND ARTIFICIAL LIGHT
Joachim von Albedyll, Augsburg; Karl Wagner, Ottobrunn, and Hans-Peter Huber, Munich, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Oct. 28, 1969, Ser. No. 870,020
Claims priority, application Germany, Oct. 31, 1968, P 18 06 487.4
Int. Cl. G03b 7/08, 7/16
U.S. Cl. 95—10 C **7 Claims**

A photographic camera wherein the aperture size is a function of scene brightness and of the position of focusing means when the exposure is made in artificial light. Changes in the position of the focusing means effect changes in sensitivity of the circuit which includes a photosensitive receiver and directly controls the diaphragm. The sensitivity of the circuit is changed by changing the resistance of a variable resistor which is connectable in parallel with the receiver or by changing the amount of scene light which reaches the receiver in response to changes in the position of the focusing means.



3,611,896
LENS PROTECTIVE DEVICE BUILT INTO THE CAMERA BODY
Koichi Aoki, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Sept. 30, 1968, Ser. No. 781,291
Int. Cl. G03b 17/00
U.S. Cl. 95—11 R **3 Claims**

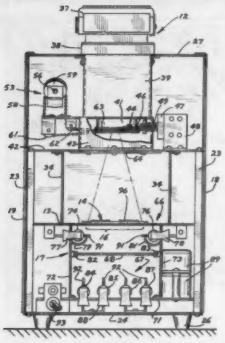


A lens protective device built into the camera body operated by and automatically operated by the shutter release mechanism so that the protective part is caused to recede out of the lens light path just before the exposure begins and to come back in front of the lens, covering it, when the release mechanism returns to its original position.

3,611,897
PHOTOGRAPHIC INSTRUMENT
William T. Owens, Jr., Long Lake, Minn., assignor to Washington Scientific Industries, Inc., Minnetonka, Minn.
Filed Mar. 21, 1969, Ser. No. 809,239
Int. Cl. G03b 19/00
U.S. Cl. 95—11 R **12 Claims**

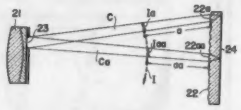
A portable photographic instrument for photographing analytical objects suspended in a transparent media placed on or in a transparent carrier to provide a film record of the objects. The instrument has a housing enclosing a platform for supporting the carrier containing the objects. A photographic system including interchangeable film backs and a lens in the housing is located above and in axial alignment to the object. Two separate light sources are located below the platform for illuminating the object. The first light source has two lights located to either side laterally of an opening in the platform to provide side illumination and a dark field. The second light source located in general axial alignment with the opening, has a series of four lamps and illuminates a

frosted glass plate from the bottom to provide a light background or field. A switch selectively activates the first



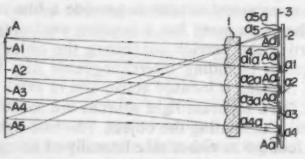
light source or the second light source so that the object can be illuminated with either a dark background or a light background.

3,611,898
MULTIPHOTOGRAPHING DEVICE
Nobunao Mikami, Kawasaki-shi, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Sept. 5, 1968, Ser. No. 767,544
Claims priority, application Japan, Sept. 11, 1967, 42/58,219
Int. Cl. G03b *41/00*
U.S. Cl. 95—18 R **1 Claim**



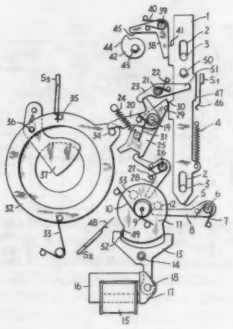
A first lens directed toward multiple objects a relatively simple cemented lens group and a second lens comprising a group of microlenses which are arrayed so as to either have a curvature corresponding to that of an image focused through said first lens or to each have a focal length different from each other, for example those microlenses at the periphery of the second lens having focal lengths different from those of the microlenses at the center portion of the second lens, so as to correspond with the curvature of the image focused through the first lens.

3,611,899
MULTIPHOTOGRAPHIC DEVICE
Hisanori Ataka, and Nobunao Mikami, both of Kawasaki-shi, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Nov. 4, 1968, Ser. No. 773,155
Claims priority, application Japan, Nov. 8, 1967, 42/71757
Int. Cl. E01c *11/10*
U.S. Cl. 95—18 R **1 Claim**



A multiphotographic device comprising a photographic lens consisting of a group of a multitude of microlenses arrayed integrally in one plane in columns and rows; and an opaque moving plate disposed between the photographic lens and a photosensitive material which is disposed backwardly of the moving plate, and having a plurality of equidistantly spaced apart aperture.

3,611,900
SWITCH MEANS FOR ELECTRIC SHUTTER
Kiyoshi Kitai, Tokyo, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan
Filed Dec. 30, 1968, Ser. No. 787,727
Claims priority, application Japan, Apr. 3, 1968, 43/21475
Int. Cl. G03b *9/04, 7/08*
U.S. Cl. 95—31 EL **4 Claims**

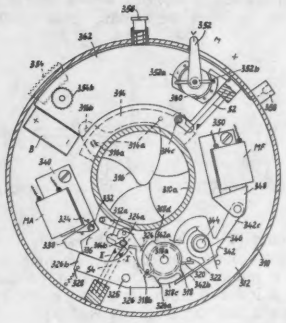


A timing circuit disconnect apparatus in a camera utilizing a timing circuit for operating the camera shutter and an electrical energy source for supplying electrical energy for the timing circuit, the disconnect apparatus including a switch connected in series between the timing circuit and the electrical energy source, which switch is opened at the termination of the shutter operation, and held open until a film winding mechanism is actuated. The disconnect apparatus includes a locking lever selectively engageable with a movable release arm that is connected to the film winding mechanism, the locking lever being arranged to lock the trigger lever in its actuated mode until the winding means is actuated to move the release arm, which in turn moves the locking lever to unlock the trigger lever and release the trigger lever from its actuated mode.

3,611,901
CONTROL ARRANGEMENT FOR PHOTOGRAPHIC APPARATUS
Paul Fahlenberg, Baierbrunn near Munich, Germany, assignor to Compur-Werk Gesellschaft mit beschrankter Haftung & Co., Munich, Germany
Filed Mar. 8, 1966, Ser. No. 532,793
Claims priority, application Germany, Mar. 17, 1965, Mar. 17, 1965, Nov. 19, 1965, C35,341;C12 835;C37437
Int. Cl. G03b *9/58*
U.S. Cl. 95—53 **11 Claims**

Electronic apparatus for controlling an adjustable part of a photographic camera. The control arrangement is set into operation by an electric impulse, produced by movement of a manually movable member to initiate the control operation. In one embodiment (FIGS. 1–14), the initiating electric impulse serves to activate a resistance bridge which comes into balance and stops further movement when a movable adjustable part on the camera reaches a position corresponding to that of a manually movable member on a control box, which may be located at a point remote from the adjustable part on the camera. In this embodiment, the adjustable part on the camera may serve to adjust a diaphragm aperture, or a shutter speed control member, or a focusing member. In a second embodiment (FIGS. 15–17), the initiating electric impulse serves to activate transistorized electronic circuitry

which controls the extent of a first exposure delay period (prior to opening the shutter blades) and also the extent of a

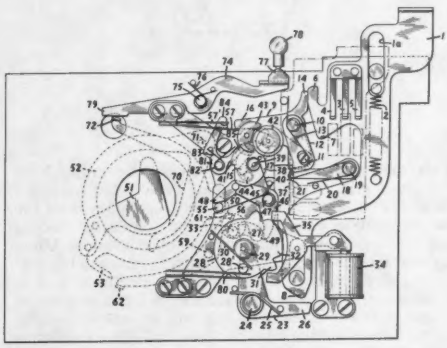


second exposure delay period while the blades are open, thus determining the duration or speed of the exposure.

3,611,902
AUTOMATIC FLASH PHOTOGRAPHY SWITCHOVER DEVICE

Kiyoshi Kitai, Tokyo, Japan, assignor to Kabushiki Kaisha Hatton Tokeiten, Tokyo, Japan

Filed June 18, 1969, Ser. No. 834,456
Claims priority, application Japan, June 19, 1968, 43/42,167
Int. Cl. G03b *9/02*
U.S. Cl. 95—64 A **4 Claims**



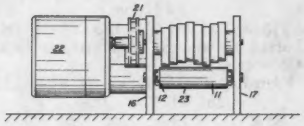
Automatic flash photography switchover device in which a camera aperture control member is controlled to take a flash exposure when the object being photographed requires flash photography. Detection of the need for a flash exposure is provided by detection circuitry and detection of readiness of the flash circuitry and detection of readiness of the flash circuitry for a flash exposure is also carried out. The aperture control for flash photography is effected only when both conditions of need for flash exposure and readiness therefor is detected, otherwise the device switches over to control the aperture for other than flash photography.

3,611,903
METHOD AND APPARATUS FOR USE IN PROCESSING RADIATION SENSITIVE ELEMENTS

Andrew Green, Harrow, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 25, 1970, Ser. No. 40,065
Claims priority, application Great Britain, June 24, 1969, 31875/69
Int. Cl. G03d *5/02*
U.S. Cl. 95—89 R **6 Claims**

An apparatus and method for use in in-packet processing of photographic film. A liquid impermeable packet containing an exposed film has processing fluid injected into the packet about the film and the film is processed by placing the packet on a moveable support and subjecting the fluid to ran-

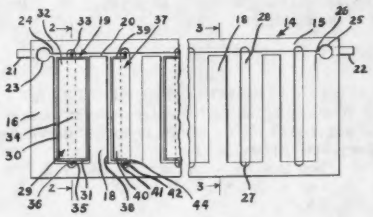


dom agitation as the packet is moved along a predetermined path by asynchronously reciprocating a plurality of beams to squeeze different portions of the packet.

3,611,904
DEVICE FOR THE WET TREATMENT OF PHOTOGRAPHIC MATERIALS

Werner W. Buechner, 4407 Gladding Court, Midland, Mich.

Continuation-in-part of application Ser. No. 677,241, Oct. 23, 1967, which is a continuation-in-part of application Ser. No. 342,459, , which is a continuation-in-part of application Ser. No. 350,612, , which is a continuation-in-part of application Ser. No. 632,842,. This application June 9, 1969, Ser. No. 843,885
Int. Cl. G03d *13/04*
U.S. Cl. 95—96 **26 Claims**

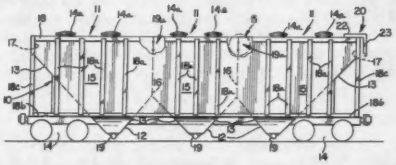


A photographic wet treatment tank is contained in an outer container for temperature control, with a vertically extending inlet and outlet for temperature controlled water in the walls of the outer container, a barrier between the bottoms of the container and of the tank, forcing the water to flow in a truly horizontal path in a narrow passage and in the form of a narrow layer around the tank.

3,611,905
VENT STRUCTURE FOR COVERED HOPPER CARS

Floyd J. Brinks, Hobart; Lucian P. Day, Jr., Highland, Ind.; Maurico F. Rosellini, Butler, and Robert A. Schmeider, Butler, Pa., assignors to Pullman Incorporated, Chicago, Ill.

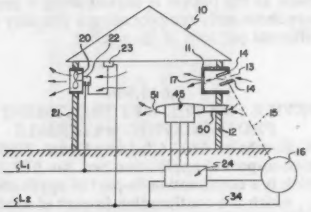
Filed May 15, 1970, Ser. No. 37,549
Int. Cl. B60l
U.S. Cl. 98—6 **9 Claims**



A venting device attached about an opening in the roof of a hopper car to permit air to enter the interior of the car during pneumatic unloading thereby equalizing pressure within the hoppers with atmospheric pressure to prevent collapsing of the car walls, and having a horizontal portion overlying the roof and a vertical depending portion disposed over the end wall in spaced relation thereto. Replaceable screening and

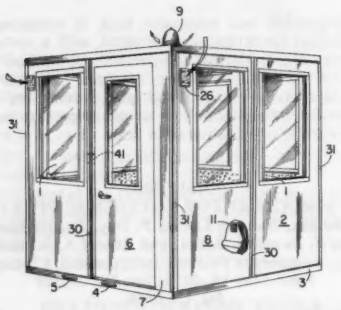
filtering members are included with the vent arrangement to prevent contamination of the inside of the car by foreign objects which could enter with the air.

3,611,906
VENTILATING SYSTEM AND CONTROL THEREFOR
Jerome L. Lorenz, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio
Filed July 24, 1969, Ser. No. 844,584
Int. Cl. F24f *13/00*
U.S. Cl. 98—33 R **8 Claims**



Dampers in the air inlet of a ventilation system for a relatively closed room or building are adjustably positioned by a reversible electric motor controlled so that although the velocity at which air is exhausted from the building may vary, the dampers regulate the inflow of air to provide a substantially constant pressure differential between the interior and exterior of the building.

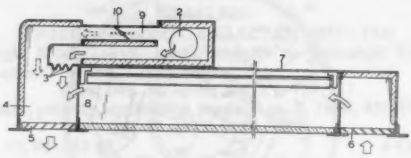
3,611,907
VENTILATED PORTABLE STRUCTURE
Seymour Wasserman, and Arthur Oppenheim, both of Plainview, Long Island, N.Y., assignors to Industrial Acoustics Company, Inc., Bronx, N.Y.
Filed Oct. 16, 1969, Ser. No. 866,942
Int. Cl. F24f *13/00*
U.S. Cl. 98—33 **7 Claims**



A portable room enclosure which incorporates within its walls acoustically lined ventilation pathways. By utilizing wall panels having self-contained ventilation pathways exposed to sound-absorbent material sandwiched within the panels ventilation of the room enclosure is achieved while avoiding the transmission of outside noise to the enclosed environment.

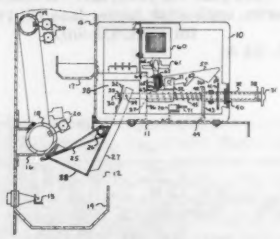
3,611,908
AIR-CONDITIONING TERMINAL UNITS
Hendrik J. Spoormaker, 56 Dorado Street, Waterkloof Ridge, Pretoria, Republic of South Africa
Continuation-in-part of application Ser. No. 753,564, Aug. 19, 1968, now abandoned. This application Mar. 17, 1970, Ser. No. 20,191
Int. Cl. F24f *13/06*
U.S. Cl. 98—38 **4 Claims**

The invention provides an air-conditioning terminal unit for use in a room topped by a false ceiling so as to provide a substantially constant air flow into the room and to take advantage, when necessary, of heat that passes from the room into the ceiling space. In the unit, conditioned air is caused to flow through induction nozzles into a discharge chamber which induces air from the ceiling space to flow into the



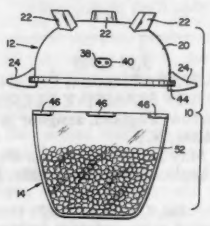
room. A stream of conditioned air, usually from the same source, is passed along a passage containing a damper in opposition to the induced air, so that when the damper is fully open, no air is induced from the ceiling space and when the damper is closed, full induction is possible.

3,611,909
FAIL-SAFE DAMPER CONTROL FOR KITCHEN VENTILATOR
Asa K. Gaylord, Portland, Oreg., assignor to Gaylord Industries, Lake Oswego, Oreg.
Filed Nov. 17, 1969, Ser. No. 877,132
Int. Cl. F23j *11/00*
U.S. Cl. 98—115 K **4 Claims**



This damper control is a part of a kitchen ventilator associated with a grill and other cooking devices and arranged to exhaust grease smoke and other cooking fumes from the kitchen. A spring-closed damper in the ventilating duct is normally held open by a latch actuated by a solenoid. Upon deenergization of the solenoid by thermostatic switches and other safety devices, or in the event of an electrical fault or power failure, the latch is released causing the damper to close. Thus, a fire in one of the cooking devices will not be drawn into the ventilating duct and any fire in the ventilating duct will be quenched by having its oxygen supply cut off.

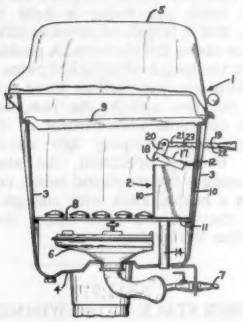
3,611,910
CORN POPPER
John S. Hughes, East Rochester, N.Y., assignor to Robeson Cutlery Co., Inc., Perry, N.Y.
Filed Jan. 17, 1966, Ser. No. 521,043
Int. Cl. A23l *1/18*
U.S. Cl. 99—238.1 **9 Claims**



Corn is popped in a shallow base covered by a substantially larger dome so that the popped corn rises into the dome, and

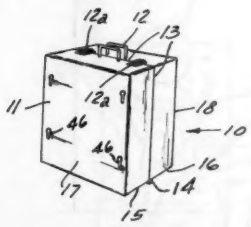
the dome is constructed so that the dome and the base can be inverted to rest the popper on the dome for separating the base from the dome and serving the popped corn in the dome. The dome is preferably transparent and removably interlocked with the base which preferably contains an electric heater.

3,611,911
SMOKE-PRODUCING DEVICE
Norman L. Martin, Lake Quivira, Kans., assignor to Locke Stove Company, Kansas City, Mo.
Filed Apr. 9, 1970, Ser. No. 26,820
Int. Cl. A23b *1/04*
U.S. Cl. 99—259 **9 Claims**



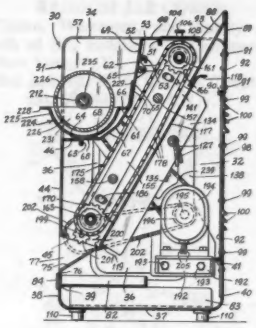
A smoke-producing device for smoke flavoring food is placed within a cooking device having heat-generating means therein and positioned above a bottom wall thereof. The smoke-producing device has walls defining a chamber therein and means communicating combustion air into the smoke-producing device from outside the cooking device. A foraminous member is mounted in the smoke-producing device and spaced from the air-communicating means for supporting smoke-producing material and the smoke-producing device has a lid which is adjustable to regulate the flow of smoke therefrom.

3,611,912
PORTABLE GRILL
Anton Choc, 636 S. Fairfield Ave., Lambard, Ill.
Filed July 10, 1969, Ser. No. 840,760
Int. Cl. A47j *37/04*
U.S. Cl. 99—339 **7 Claims**



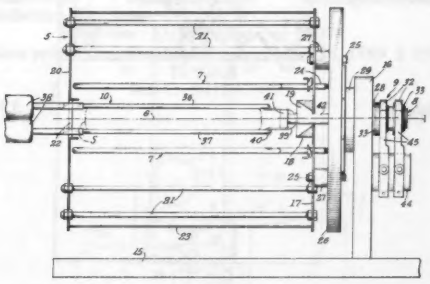
A portable grill comprising a hinged carrying case openable to form an elongated planar grill base or counter top, legs swingable out of the case to support the base at an elevated horizontal position, sidewall forming members fitting in the case and attachable to the top of the base to form supports for hot coal holding racks also fitting in the case and selectively mountable on the sidewalls either parallel to the base or perpendicular thereto for grilling or rotisserie operation.

3,611,913
AUTOMATIC BUN GRILL
William L. McGinley, Dallas, Tex., assignor to American Home Products Corporation, New York, N.Y.
Filed Aug. 18, 1969, Ser. No. 850,870
Int. Cl. A47j *37/08*
U.S. Cl. 99—349 **7 Claims**



A bun grill having chain conveyor means for conveying buns across the surface of a heated grill plate. The grill plate and the conveyor means are inclined from vertical so that the weight of the conveyor chains applied to the buns will hold the buns against the grill plate. On the other hand, the grill plate and conveyor means are inclined toward vertical to permit the bun grill housing to occupy a minimum of counter space. The space between the grill plate and the conveyor assembly is adjustable. The entire conveyor assembly is mounted on rods in tracks for removal of the assembly for cleaning. The grill plate is heated gradually from its upper end to its lower end to avoid sticking of the buns. A butter roll is driven by the same motor that operates the conveyor assembly. Heat from the grill plate keeps butter liquid in the butter pan so that a uniform film will always be present on the surface of the butter roll, and no additional butter heaters are required.

3,611,914
STEAK BROILER
Ross C. Wood, 433 California St., El Segundo, Calif.
Filed Sept. 15, 1969, Ser. No. 858,077
Int. Cl. A47j *37/07*
U.S. Cl. 99—391 **8 Claims**



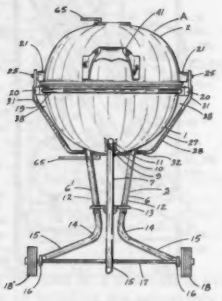
An electric broiler for steaks and similar flat cuts of meat in which the broiling elements and the steaks rotate together about an axis so the flat sides of the steaks are continuously exposed to the heat of said elements during all positions thereof during broiling.

3,611,915

BARBECUE COOKER

Harold Glaser, St. Louis County, Mo.; Richard L. Keats, Port Washington, N.Y.; Charley Leach, St. Louis County, Mo., and Jerry D. Wood, Plainfield, N.J., assignors to Glaser Products Corporation, St. Louis, Mo.

Filed Oct. 24, 1969, Ser. No. 869,093
Int. Cl. A47j 37/07
U.S. Cl. 99—445 9 Claims



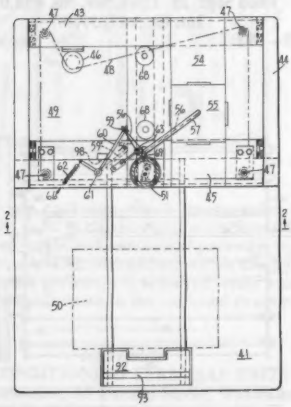
A barbecue cooker of the kettle type which comprises a hemispherical hood or dome-shaped closure and a rounded fire bowl, with hinge means connecting said hood and bowl so as to allow the former to be swung between closed and open condition with respect to said bowl without necessitating disengagement between the same. There is provided within the bowl a cooking grill having a multiplicity of rib members directed inwardly and downwardly toward an inner opening whereby the juices from the meats being cooked will flow toward the said inner opening for flow downwardly therethrough into a receptacle presented therebelow, thus obviating drippings falling on the charcoal with resultant flaring and the like.

3,611,916

BUNDLE-BINDING MACHINE AND PROCESS

Stephen Valan, 1018 Apgar Terrace, Rahway, N.J.

Filed Apr. 2, 1969, Ser. No. 812,784
Int. Cl. B65b 13/34
U.S. Cl. 100—4 12 Claims



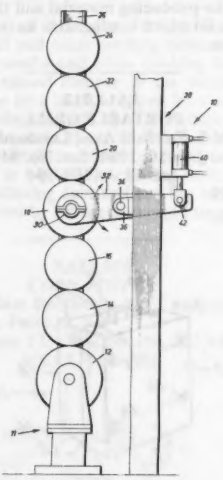
Bundles are bound by twine in a machine having a frame carrying a horizontal platform having space above it for pushing in bundles to be bound. Centrally mounted on the top of the frame is a ram motor which projects forwardly and above the platform space. It carries a vertically reciprocative ram, on the bottom of which is mounted a twine-aligning assembly designed to pass twine through it and to project the twine away from it and into the gripping means when the ram reaches the bottom of its stroke. A feeding means on the top of the frame feeds a supply of slack-free twine to and through the assembly. One switch is provided for actuating the ram motor for the downward stroke of the ram after the bundle has been pushed onto the platform. Another switch is actuatable by the ram at the end of its downward stroke and it serves to initiate the twine gripping, crimping and cutting mechanisms. The twine-gripping mechanism is mounted below the platform and it serves to grip the twine after it has been inserted therein by the assembly, and it holds the twine during and after the binding operation. Thereafter, the twine is fastened by a clip, a crimped strip piece of metal in a mechanism mounted below the platform. A cutting mechanism then cuts the twine free of its supply, and a third switch actuates the ram motor to return the ram to its uppermost position while the twine is held by the gripping mechanism so that a length of twine is stretched vertically across the space above the platform. A pushing means pushes the bundle into the length of stretched twine until the bundle is on the platform encompassed on three sides by the twine. By actuating the first switch, the ram, on its downward stroke, effects complete encirclement of the bundle, after which the gripping, crimping and cutting mechanisms complete the binding operation. An alternative cutting means, when using a thermoplastic twine, consists in cutting the twine with a heated knife with enough contact time to fuse together the two cut ends below the clip and thus strengthen further the binding.

3,611,917

CALENDER STACK WITH SWIMMING ROLL

Rodney Harold Bryce, Lachine, Quebec, and Robert Maximilian Vadas, Montreal, Quebec, both of Canada, assignors to Dominion Engineering Works, Limited, Quebec, Canada

Filed June 3, 1968, Ser. No. 734,146
Claims priority, application Canada, June 9, 1967, 992,576
Int. Cl. B30b 3/04
U.S. Cl. 100—162 4 Claims

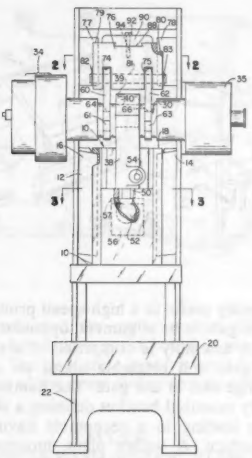


The use of a stacked paper calender with a single stack of rolls in place of the usual tandem arrangement is promoted by providing an intermediate variable deflection roll and controlling the internal fluid pressure within the roll to control roll deflection under load in relieving or increasing the nip loads in the lower portion of the stack. The intermediate roll is supported by end bearings which are provided with control means for applying upward relief force.

3,611,918
PRESS

Daniel W. Marsh, and Bertram W. Perkins, Jr., both of Warren, Mass., assignors to Perkins Machine Company, Warren, Mass.

Filed Sept. 29, 1969, Ser. No. 861,863
Int. Cl. B30b 1/06
U.S. Cl. 100—214 8 Claims

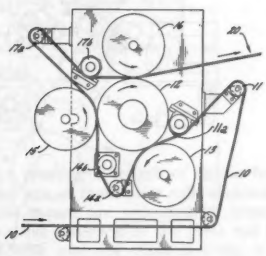


Press with counterbalanced ram mounted for longitudinal reciprocation in a frame, a pitman being coupled to the ram and connected to a crankshaft for pivotal movement with respect to a first axis spaced from the axis of rotation of the crankshaft, a counterweight for the ram being mounted for longitudinal reciprocation and being aligned with the ram, and a pitman assembly coupled to the counterweight and connected to the crankshaft for pivotal movement with respect to a second axis spaced from the axis of rotation of the crankshaft and in a direction opposite the direction of spacing of the first axis.

3,611,919
METHOD AND APPARATUS FOR MULTIPLE EMBOSSING OF CONTINUOUS WEBS

Gordon D. Thomas, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 20, 1968, Ser. No. 785,508
Int. Cl. B44b 5/00
U.S. Cl. 101—23 7 Claims

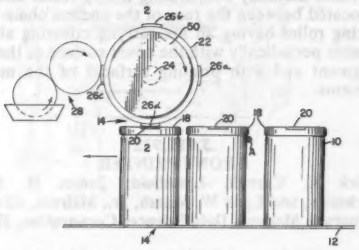


A method and apparatus of forming two or more embossments repeated continuously along the length of a flexible web and out of register with each other. The embossments are formed by passing the web through two or more embossing stations on the surface of a single embossing roll, and drawing the web away from the surface of the embossing roll between successive embossing stations. The flexible web may be made of cellulosic tissue or other substantially nonresilient material, and reinforced with resilient threads or other elements extending continuously in the longitudinal direction of the web so as to maintain a constant web length between pairs of successive embossing stations. The resulting product is also disclosed.

3,611,920
RANDOM JAR CODER

Charles A. Timko, Westmont, and Lanny A. Oberhofer, Chicago, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Jan. 10, 1969, Ser. No. 790,386
Int. Cl. B41f 17/16, 17/24
U.S. Cl. 101—35 1 Claim

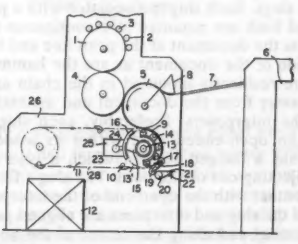


An apparatus for imprinting a code or other marking on articles, such as capped jars, which comprises a printing or coding wheel having a series of circumferentially spaced printing die elements and rotatably mounted at a printing station above a straight line conveyor on which capped jars or other articles, are advanced, the wheel being disposed at an elevation to bring the die elements into engagement with the tops of jars advanced to the station and a drive for the wheel which includes a differential gear system for accelerating or decelerating the printing wheel and a stepping motor which is responsive to sensors spaced along the path of advance of the jars as they approach the printing station and operating to sense the location of the jar tops relative to the printing station. The sensors are connected through electric circuitry with a control device including a timer whereby the rotation of the printing wheel is adjusted so that the die elements match the spacing of the advancing jar tops and a die element is engaged with each successive jar top to print a code thereon.

3,611,921
SHEET-FED OFFSET PRINTING MACHINE HAVING A NUMBERING DEVICE

Hans-Georg Jahn, Wiesloch, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidleberg, Germany

Filed Mar. 27, 1970, Ser. No. 23,376
Claims priority, application Germany, Mar. 28, 1969, P 19 15 921.8
Int. Cl. B41l 47/46
U.S. Cl. 101—77 7 Claims



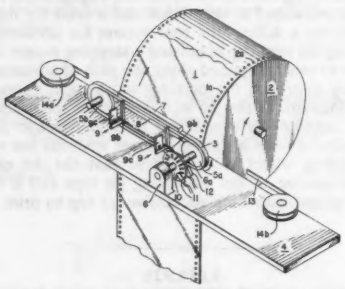
A sheet-fed offset printing machine having an impression cylinder from which a sheet is being imprinted includes a

revolvable endless chain delivery having a pair of opposing sprocket wheels mounted on respective shafts, a gripper bridge on the chain delivery for gripping and removing the sheet from the impression cylinder, a numbering device including numbering mechanisms mounted on one of the sprocket wheel shafts so as to cover part of the periphery of the respective sprocket wheel and a counterpressure roller adjacent and cooperating with the numbering mechanisms, the part of the sprocket wheel periphery being coverable by the sheet being removed from the impression cylinder, an ink carrier segment rotatable about the one sprocket wheel shaft and located between the runs of the endless chain delivery, the segment having an ink-carrying cover surface, an ink fountain mounted outside the endless chain delivery and including a lifter roller engageable with the cover surface through revolving zones of the endless chain delivery, that are free of superposed sheets and are located directly upstream of the gripper bridge, for supplying ink to the cover surface, and mutually cooperating inking roller and friction roller located between the runs of the endless chain delivery, the inking roller having an ink-carryng covering alternately engageable periodically with the cover surface of the ink carrier segment and with printing surfaces of the numbering mechanisms.

3,611,922
FRONT PRINTER

Frederick E. Carroll, Lynnfield; James H. Edwards, Winchester, and Lynn W. Marsh, Jr., Melrose, all of Mass., assignors to Mohawk Data Sciences Corporation, Herkimer, N.Y.

Filed Aug. 28, 1969, Ser. No. 853,752
Int. Cl. B41j
U.S. Cl. 101—93 **11 Claims**

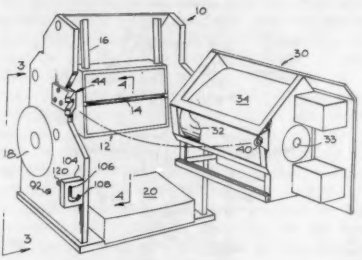


A printer in which selectively activated hammers drive selected print slugs against a document by striking interposers which are maintained in contact and associated with the selected slugs and which transmit the force of the hammers to the slugs. Each slug is associated with a particular interposer and both are mounted in a continuous chain which moves across the document at the print line and is located on the same side of the document as are the hammers. The interposers are resiliently mounted in the chain and the slugs are biased away from the document and maintained in contact with the interposers. Preferably, each slug is partially located in an open-ended bore within its associated interposer and has a flanged end on which a type character is located projecting out of the bore. The slug's flange is maintained in contact with the open end of the interposer and the centroids of the slug and interposer are aligned perpendicular to the document and along the center of the bore. Thus, an impact force on the interposer is transmitted to the flange of the slug to drive the slug toward, and perpendicular to the document.

3,611,923
PRINTER DRUM GATE LATCH ASSEMBLY

George M. Haramia, Santa Ana, and Harry Katt, Tarzana, both of Calif., assignors to Data Products, Woodland Hills, Calif.

Filed Aug. 14, 1969, Ser. No. 850,052
Int. Cl. B41j *29/02*
U.S. Cl. 101—93 R **8 Claims**

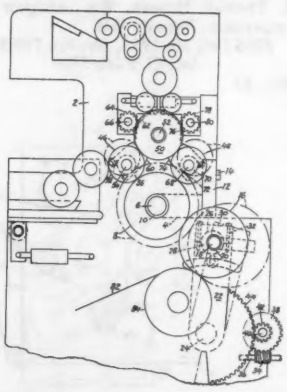


A latch assembly useful in a high-speed printer for latching a hinged drum gate into alignment opposite to a hammer bank. The latch assembly is comprised of a roller mounted on the drum gate and rotatable about an axis extending through the hinge axis of the gate. The hammer bank frame carries a fixedly mounted bracket defining a slightly inclined entrance ramp leading to a receptacle having a precisely defined flat surface. A wedge plate, mounted for pivotal movement adjacent the bracket, is held in an unlatched position by a pivotable pawl when the roller is not present on the flat surface. As the roller rolls up the ramp on to the flat surface, it engages the pawl to release the wedge plate which, by spring action, is pivoted to a position with its wedge surface engaging said roller and locking it into said receptacle.

3,611,924
ROTARY OFFSET PRINTING PRESS WITH CYLINDER INTERRUPTER

Dewey L. Harrison, Fort Worth, Tex., assignor to National Productive Machines Incorporated, Elkridge, Md.

Filed Oct. 23, 1969, Ser. No. 870,446
Int. Cl. B41f *13/20, 7/04*
U.S. Cl. 101—218 **1 Claim**



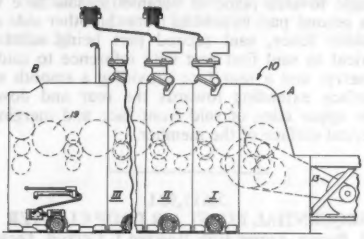
An offset printing press wherein the printing and blanket rolls are readily changeable to permit the use of rolls of different diameters for printing sheets of different length and wherein the blanket roll is mounted on a pivoted arm adapted to be moved toward and away from the printing roll and impression roll and to be locked in an adjusted position to which it is moved.

3,611,925

PRINTER-SLOTTER MODULE GEAR TRAIN BRAKE

Henry E. Kulwicki, Willingboro, N.J., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Feb. 24, 1969, Ser. No. 801,352
Int. Cl. B41f *13/00*
U.S. Cl. 101—183 9 Claims



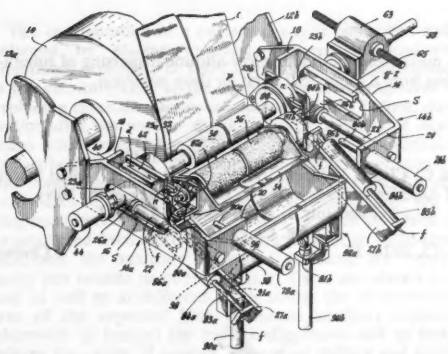
A printer-slotter used for printing and slotting carton blanks of double-faced corrugated board is provided with a gear train brake. The gear train brake is used for preventing undesired rotation of the gears during certain operations.

3,611,926

ROTARY PRESS WITH INTERRUPTABLE AND REMOVABLE PRINT ROLL

James Reid Johnson, Stonington, Conn., assignor to The Johnson Fast Print Machine Corporation, Brooklandville, Md.

Filed May 29, 1969, Ser. No. 829,056
Int. Cl. B41f *13/14, 13/40*
U.S. Cl. 101—247 9 Claims



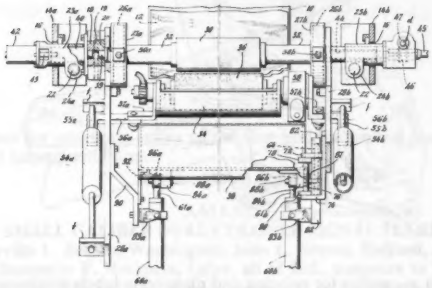
In a machine for printing a length of fabric between a backing cylinder and one or more print rolls disposed around the backing cylinder means are provided for connecting a print roll to rotary drive means after the print roll has been placed in the machine and for disconnecting it without removing it from the machine. This is accomplished by providing support means movable toward and away from the backing cylinder and defining sleeves, through one of which extends a reciprocal driven shaft which is adapted to engage an end of the print roll mandrel or journal, and through the other of which extends an axially reciprocal shaft by which the print roll assembly and driven shaft may be adjusted in position axially.

3,611,927

FABRIC PRINTING MACHINE EMPLOYING A WASHER-RECEPTACLE

James Reid Johnson, Stonington, Conn., assignor to The Johnson Fast Print Machine Corporation, Brooklandville, Md.

Filed May 29, 1969, Ser. No. 829,049
Int. Cl. B41f *35/04*; B41l *41/04*
U.S. Cl. 101—425 1 Claim



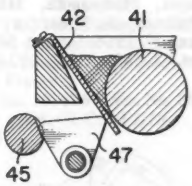
In a machine for printing lengths of fabric employing a washer-receptacle in association with a color box the washer-receptacle is mounted in such a way that it is movable toward and away from a backing cylinder as part of a print roll assembly which includes the color box, and is capable of swinging movement around one end toward and away from the color box and the body of the machine, and is movable up and down, toward and away from the color box.

3,611,928

INK SUPPLY REGULATION DEVICE FOR OFFSET PRINTING PRESS

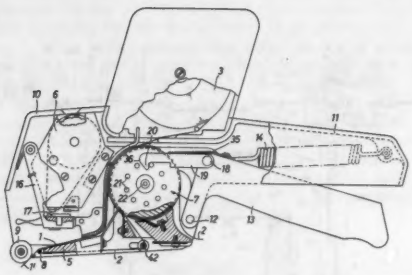
Tamaki Kaneko, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Aug. 19, 1969, Ser. No. 855,450
Claims priority, application Japan, Aug. 24, 1968, 43/60801
Int. Cl. B41f *31/04*
U.S. Cl. 101—365 5 Claims



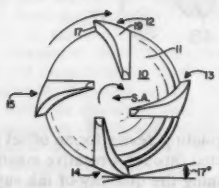
An ink supply regulating device for an offset press wherein a cam rod is connected through a rotative means with a regulating plate determining the quantity of ink supplied. A plurality of recesses are formed in the cam rod in varied arrangement. The rotative means is either a plurality of rollers or a rockable member and the setting of the regulating plate is determined by the member of recesses into which the rollers or rockable member are received as the cam rod is rotated.

3,611,929
LABEL DISPENSING APPARATUS
Kurt Schrotz, Brentanastrasse 29B, Hirschorn/Neckar and Werner Becker, 6932 Hirschorn, Itaupstrasse 25, Hirschorn, both of Germany
Filed Aug. 11, 1969, Ser. No. 849,030
Claims priority, application Germany, Aug. 14, 1968, P 17 86 068.3
Int. Cl. B41f *1/08*
U.S. Cl. 101—292 20 Claims



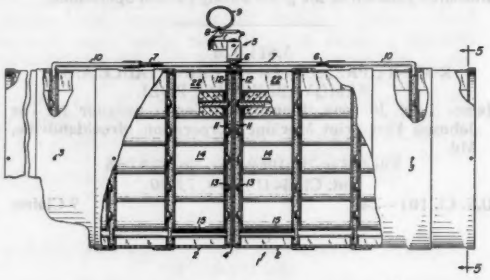
An apparatus for printing and dispensing labels temporarily adhered to a support tape by means of a pressure-sensitive adhesive, the support tape being provided with openings, such as apertures or marginal indentations, at intervals corresponding to the spacing of the leading edges of the labels, the apparatus including a transport system which intermittently advances the support tape through successive increments corresponding to the advancement of a label to bring the labels sequentially into accurate registration with a printing position and a dispensing position, the transport system having a transport roll including a peripheral feed surface, means for intermittently driving the transport roll through successive angular increments which advances the peripheral feed surface through successive increments corresponding to the advancement of a label, projections extending from the feed surface for entering the openings in the support tape with sufficient clearance to permit the support tape to engage the feed surface only when the openings are registered with the projections, and means for maintaining the support tape against a portion of the feed surface extending around the transport roll through an angle of greater than 90° to establish a frictional force between the support tape and the feed surface sufficient to assure that the support tape will be frictionally gripped and advanced by the transport roll.

3,611,930
SPHERICAL SHAPED BODY WITH AERODYNAMIC TORQUE RIBS
Robert S. Kensinger, Minneapolis, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.
Filed June 27, 1966, Ser. No. 560,707
Int. Cl. F42b *25/20*, *25/24*
U.S. Cl. 102—4 6 Claims



1. A generally spherically shaped member having a plane of symmetry and an axis passing substantially through the geometric center of said member normal to said plane of symmetry, said member further having external aerodynamic features which will cause it, when placed into an airstream, to spin about said axis regardless of the orientation of said member relative to the airstream, said aerodynamic features including a plurality of torque ribs, each of said ribs having: an aerodynamic fence centered on said plane of symmetry and extending a short distance to either side of it; a front face having a first part extending from one side of said aerodynamic fence for a short distance substantially parallel to said plane of symmetry, then curving in a circular radius away from said plane of symmetry into a segment at an angle to said plane of symmetry, said face further having a second part extending from the other side of said aerodynamic fence, said second part being substantially symmetrical to said first part with reference to said plane of symmetry; and a rear face providing a smooth streamlined surface extending towards the rear and downward from the upper edge of said front face and merging with the spherical surface of the member.

3,611,931
SEQUENTIAL BURST AIR DROP CLUSTER
Murell J. Bessey, Forest Hill; Howard I. Carroll, Forest Hill, and William J. Franklin, North East, all of Md.
Filed May 5, 1969, Ser. No. 821,585
Int. Cl. F42b *25/16*
U.S. Cl. 102—7.2 4 Claims



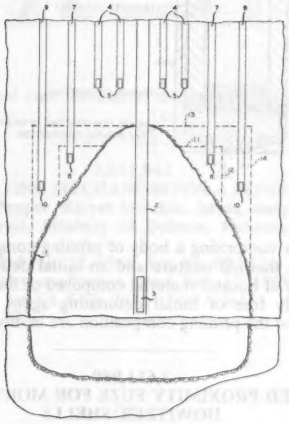
A means and method for low-altitude dispersing of submunitions from a sequential burst air drop munition.

3,611,932
SHAPED WAVE GENERATOR
Irvin G. Clator, Dahlgren, Va., assignor to The United States of America as represented by the Secretary of the Navy
Filed July 3, 1969, Ser. No. 838,941
Int. Cl. F42b *1/00*
U.S. Cl. 102—22 8 Claims

A layer of explosive having its shape correlated to its explosive force and detonation rate to form, upon initiation, a shock wave of the desired shape. A layer of fragmenting

material may be provided to initiate, by impact, the entire surface of a charge having the same shape as the shock wave, and a backing layer may be provided to direct the explosive force in the desired direction.

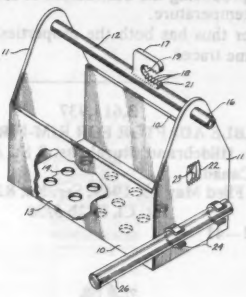
3,611,933
NUCLEAR CAVITY CONFIGURATION CONTROL
William C. Lanning, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Dec. 29, 1967, Ser. No. 694,649
Int. Cl. F42d 7/00
U.S. Cl. 102—23 **11 Claims**



The configuration of a nuclear cavity is controlled and/or enlarged by placing auxiliary conventional explosives, directional explosives or small nuclear charges approximately at the circumference of the chimney or cavity expected and exploding these simultaneously or sequentially before, during and/or after the nuclear shock to create a cavity of desired shape which preferably will be substantially cylindrical. In one embodiment, the invention is applied to the enlargement and control of the shape of the desired cylindrical hole or cavity shot in oil shale thus to substantially enlarge the underground retort volume and amount of shale oil which can be recovered from a given formation area. In an embodiment described, the auxiliary explosives surround the expected cavity just outside its circumference. There are placed in the roof as well as at different levels across the cross-sectional area of the expected hole additional auxiliary explosives wherewith to control the roof configuration and to further enlarge the cavity, if needed. Sequential drilling and exploding of a series of charges, especially in the area of the top of the cavity, is disclosed.

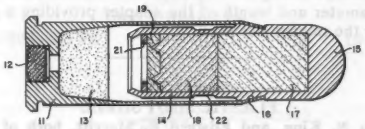
3,611,934
APPARATUS FOR SETTING SAFETY FLARES
Roger W. Schaefer, Arcadia, Calif., assignor to Kel-Lite Industries, Inc., Covina, Calif.
Filed Oct. 20, 1969, Ser. No. 867,459
Int. Cl. C06d 1/04
U.S. Cl. 102—37.4 **13 Claims**

A convenient carrying box or tray is provided for handling pyrotechnic flares such as are widely employed for safety marking at highway accidents and the like. A serrated jaw on the box serves to grip the cap of a flare so that, with one hand, flares can be rapidly decapped for use. A box handle and a ramp guide a flare into the decapper. A cap holder supports a cap having a striking surface for lighting a flare and spring clips or the like are provided for holding a lighted



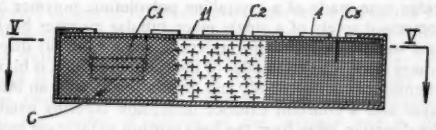
flare for providing safety to the user and an ignition source for subsequent flares.

3,611,935
SMALL CALIBER DUAL COLORED SIGNAL FLARE
Orville L. Beckes, Washington; John L. Brown, Bedford, and Benjamin F. Harkness, Odon, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy
Filed Oct. 31, 1969, Ser. No. 872,817
Int. Cl. C06d 1/10
U.S. Cl. 102—37.7 **6 Claims**



A small caliber dual colored signal flare having a cartridge case holding a primer and a charge of expelling powder, and a projectile body partially extending into and attached to said cartridge case. The projectile body contains a first pyrotechnic composition which, upon burning, provides a green colored display and also a second pyrotechnic composition which, upon burning after said first composition is consumed, provides a red colored display. The projectile body is provided with an undercut so that after the first pyrotechnic composition is consumed the projectile body will sever in order to provide better illumination of the burning of said second pyrotechnic composition.

3,611,936
PYROTECHNIC TRACER
Jean Marie Bouisse, Poudrerie Nationale de, Bont de Buis, and Franck Villey Desmeserets, Poudrerie Nationale de, St-Chamas, both of France
Filed Dec. 15, 1969, Ser. No. 885,113
Int. Cl. C06d 1/10
U.S. Cl. 102—37.8 **13 Claims**



A tracer having a pyrotechnic charge as designed for locating and guiding missiles of different types, comprising a casing which accommodates the pyrotechnic charge and a plate covering the charge and serving as a radiation emitter. The

pyrotechnic charge comprises a portion which serves to heat the emitting plate to incandescence and a portion which is capable of producing the destruction of said plate as a result of a rise in temperature.

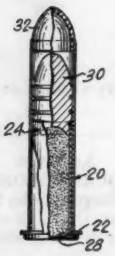
The tracer thus has both the properties of a plate tracer and of a flame tracer.

3,611,937

RELOADABLE ADAPTOR FOR RIM-FIRE CARTRIDGES

Friedrich G. Hildebrand, Rural Rte. 2 St. Agathe de Montes, Quebec, Canada

Filed May 15, 1969, Ser. No. 824,853
Int. Cl. F42b *5/00*
U.S. Cl. 102—41 **2 Claims**



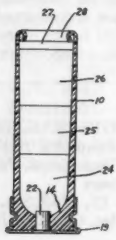
An adapter shell for forming rimfire or centerfire ammunition, the shell fitting over a first shell of smaller size, the outside diameter and length of the adapter providing a gastight fit over the smaller size shell.

3,611,938

PLASTIC SHOT SHELL

William N. King, and Edward E. Merritt, both of Anoka, Minn., assignors to Federal Cartridge Corporation, Minneapolis, Minn.

Continuation of application Ser. No. 486,902, Sept. 13, 1965, now abandoned , Continuation of application Ser. No. 309,824, Sept. 18, 1963, now abandoned , Continuation-in-part of application Ser. No. 132,742, Aug. 14, 1961, now abandoned. This application June 24, 1969, Ser. No. 856,870
Int. Cl. F42b *5/30*
U.S. Cl. 102—43 P **17 Claims**



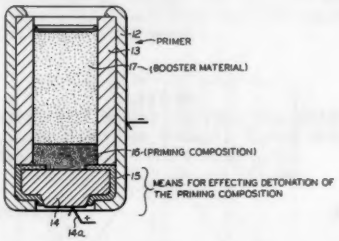
A plastic shot shell formed of a seamless one-piece cartridge case made of a crystalline polyolefinic polymer being comprised solely of a single piece tubular member having a base wad portion of uniform density and a centrally disposed primer bore. The remainder of the tubular portion is biaxially oriented circumferentially and longitudinally with an internal taper and a constant exterior dimension tapering axially in the direction away from the base portion to increase molecular orientation and strength proportionally in said direction. The shell is completed with the addition of primer, powder and shot, the latter being positioned in a pouch near the open end of the tube with the open end being folded down to complete the shell.

3,611,939

PRIMER

Hans Stadler, Rankestrasse 55, 85 Nurnberg; Heinz Gawlick, Boenerstr. 32, 851 Furth i.B, and Hellmut Bendler, Carl v. Lindestr. 28a, 85 Nurnberg, Furth/Bay, all of Germany

Division of Ser. No. 691,647, Dec. 18, 1967, Pat. No. 3,499,386, which is a continuation of application Ser. No. 612,049, Jan. 26, 1967, now abandoned, which is a continuation of application Ser. No. 326,457, Nov. 27, 1963, now abandoned. Filed Jan. 22, 1970, Ser. No. 4,960
Claim priority, application Germany, Nov. 29, 1962, D 40,379.
Int. Cl. F42b *9/08*
U.S. Cl. 102—46 **2 Claims**



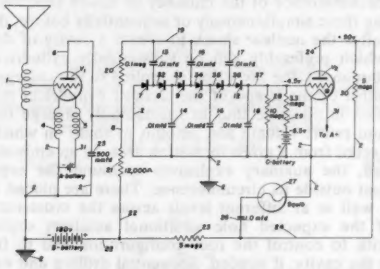
A primer comprising a body of priming composition composed of a thermal mixture and an initial detonating agent, and a body of booster material composed of thermal mixture substantially free of initial detonating agent. The booster material and the priming composition are in direct contact.

3,611,940

SIMPLIFIED PROXIMITY FUZE FOR MORTAR AND/OR HOWITZER SHELLS

John J. Hopkins, Silver Spring, Md., and Robert H. Thayer, Chicago, Ill., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 27, 1948, Ser. No. 11,478
Int. Cl. F42c *13/04*
U.S. Cl. 102—70.2 P **2 Claims**



A novel electrical system relating to a proximity fuze which provides rectifying and capacitive amplification as a substitute for tubes.

3,611,941

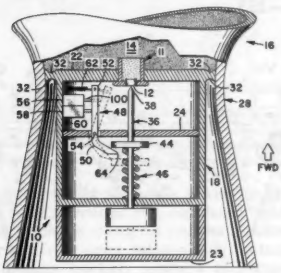
IGNITING DEVICE

George H. Hopmeier, Rochester, Mich., assignor to LTV Aerospace Corporation, Dallas, Tex.

Filed Feb. 11, 1969, Ser. No. 798,330
Int. Cl. F42c *15/04, 15/24, 15/34*
U.S. Cl. 102—75 **5 Claims**

A device for actuating a propellant charge of a launched projectile wherein a member moves in response to positive

and/or negative acceleration of the projectile to actuate the propellant charge or to actuate a delaying means and obtain, at a preselected time thereafter, setting off of the propellant charge.

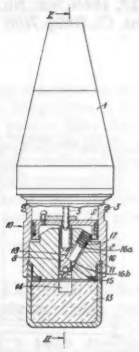


3,611,942

DETONATING MECHANISM FOR A BOMB FUSE

Jakhin Boaz Popper, Kiryat Motzkin, Israel, assignor to The State of Israel, Ministry of Defence, Hakiria, Tel Aviv, Israel

Filed Feb. 25, 1969, Ser. No. 802,111
Claims priority, application Israel, Feb. 27, 1968, 29537
Int. Cl. F42c *9/04, 15/34, 19/12*
U.S. Cl. 102—85.6 **2 Claims**



A bomb fuse whose arming is dependent, inter alia, on the disposing of the fuse detonator in such a position that it is capable of detonating the booster explosive of the fuse.

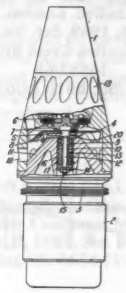
3,611,943

BOMBS FUSES COUPLED AXIAL IMPELLER AND GENERATOR ROTOR JOINTLY SHIFTABLE REARWARDLY DURING LAUNCHING TO PREVENT ROTATION THEREOF

Jakhin Boaz Popper, Kiryat Motzkin, Israel, assignor to The State of Israel, Ministry of Defence, Hakiria, Tel Aviv, Israel

Filed Feb. 25, 1969, Ser. No. 802,112
Claims priority, application Israel, Feb. 27, 1968, 29535
Int. Cl. F42c *9/02, 15/26;* **F42b** *9/08*
U.S. Cl. 102—86 **3 Claims**

A bomb fuse having an impeller or turbine adapted to rotate upon release or launching of the bomb, the impeller being coupled to a detonator mechanism so that at the required instant, after a predetermined number of turns of the impeller, the motion of the latter is effective in moving the detonator mechanism into the armed position.

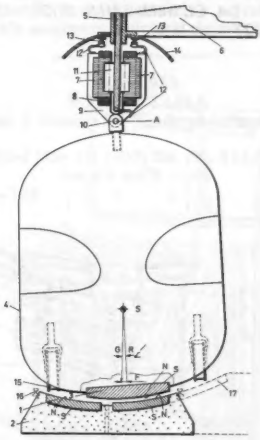


3,611,944

SUSPENDED VEHICLE CONSTRUCTION

Otto Reder, Baden-Baden, Germany, assignor to Messershmitt-Bolkow GmbH, Ottobrunn, near Munich, Germany

Filed Mar. 3, 1969, Ser. No. 803,619
Claims priority, application Germany, Mar. 6, 1968, P 16 80 357.9
Int. Cl. B61b *13/08*
U.S. Cl. 104—23 FS **15 Claims**



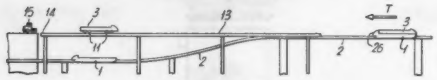
A ground or top supported tracked vehicle includes a carriage which is suspended above a trackway by air pressure or magnetic force and which is moved along the trackway and braked by a linear electric induction motor. The carriage is supported in spaced relationship to a curved track or rail by the air pressure gap or the magnetic force gap and is maintained during motion without ground or track contact. The carriage is constructed to pivot from a pendular hinge for lateral swinging movement. The pendular axis is located above the center of gravity of the carriage and is advantageously formed at the lower end of an induction motor or as one of the moving parts of the motor. The construction includes sliding pads or rollers which run along a substantially vertically arranged electroconductive reaction rail without being supported vertically on the rail.

3,611,945

VEHICLES FOR TRAVELLING ALONG A PREPARED TRACK AND METHOD OF USE

Geoffrey John Easton, Christchurch, and Michael Anthony Stockford, Cambridge, both of England, assignors to Tracked Hovercraft Limited, London, England

Filed Apr. 4, 1969, Ser. No. 813,657
Claims priority, application Great Britain, Apr. 5, 1968, 16583/68
Int. Cl. B61k *1/00*; B61b *13/08*; B61k *5/02*
U.S. Cl. 104—32 2 Claims



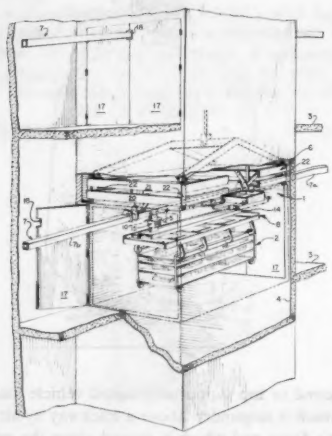
A tracked air cushion vehicle has a detachable passenger compartment. The compartment can carry extendable wheels which will engage an auxiliary track diverging from the vehicle track. If the wheels are extended and means securing the compartment to the vehicle are released, the compartment will automatically become detached and will travel along the auxiliary track as the vehicle continues along the vehicle track. In one use, passengers are conveyed directly from a city center terminal to the desired pier at an airport without leaving the compartment.

3,611,946

ELEVATOR TRANSFER MECHANISM

Donald G. Heximer, N. Tonawanda, and Walter D. Sullivan, Snyder, both of N.Y., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Feb. 26, 1970, Ser. No. 14,443
Int. Cl. B66b *17/18*, *17/20*
U.S. Cl. 104—127 16 Claims



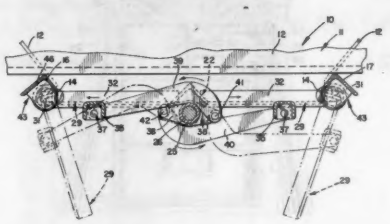
A mechanism for transferring a trolley between a transfer conveyor rail, which is carried for vertical movement by an elevator car, and stationary overhead conveyor rails arranged at the floor levels to be served by the elevator car. The transfer rail, together with a powered device operable to transfer the trolley between the rails, is supported on a platform, which is in turn loosely suspended as a unit from the elevator car. Cam leveler devices are carried on the platform for the purpose of automatically adjusting the unit relative to the elevator car, when the latter is stationary adjacent a floor level to be served, in order to accurately align the transfer rail with the stationary rails at such floor level.

3,611,947

TOGGLE HOPPER DOOR OPERATING MECHANISMS

Ernest J. Nagy, Munster, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed June 23, 1969, Ser. No. 835,609
Int. Cl. B61d *7/18*, *7/20*, *7/26*
U.S. Cl. 105—253 14 Claims



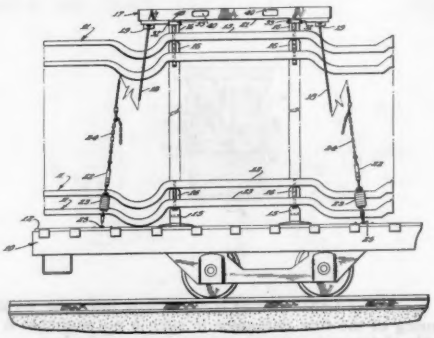
A hopper structure includes a bottom discharge arrangement having hinged doors which are movable to open and closed positions and which include an operating mechanism providing for an initial limited horizontal movement of said doors to disengage them from a locked and supported engagement with the hopper structure and whereupon doors are opened by gravity. The operating mechanism includes a manually actuated operating head which can be indexed to certain positions and with a suitable tool the operator can in one position close said door and in the other position open the same.

3,611,948

ADJUSTABLE HARNESS FOR AUTO FRAME CAR

Richard A. Tatina, Chicago, Ill., assignor to Portec, Inc., Oak Brook, Ill.

Filed Oct. 27, 1969, Ser. No. 869,625
Int. Cl. B60p *7/08*
U.S. Cl. 105—367 12 Claims

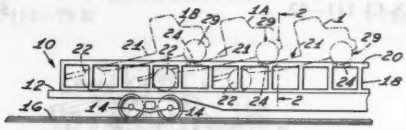


Tiedown harness for tying stacks of vehicle frames to the flat deck of a railway car. The harness has side beams extending along the tops of the outer rails of two side-by-side stacks of vehicle frames and tied together in spaced-apart relation intermediate their ends. End beams extend between the side beams and are bodily adjustable along the side beams in accordance with the length of the vehicle frames in the stacks. Downwardly opening centering cups are carried on the end beams, for engagement with top spacers on the outside rails of the vehicle frames, to hold the frames to the deck of the car and are adjustable along the end beams to take care of varying widths of frames. A centrally downwardly opening centering member is carried by each end beam and is sufficiently long to engage the top spacers on the inner rails of the side-by-side vehicle frames.

3,611,949
SADDLE YOKE ASSEMBLY

Israel D. Peisner, Huntington Woods, Mich., assignor to Whitehead & Kales Company, River Rouge, Mich.

Filed July 25, 1969, Ser. No. 844,872
Int. Cl. B65g 67/00; B60p 7/08
U.S. Cl. 105—368 R 14 Claims

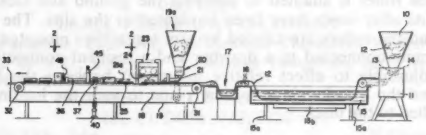


This disclosure relates to saddle yokes for supporting the front ends of vehicles loaded in a simulated "saddleback" arrangement on a vehicle transport such as a railcar. Each saddle yoke has a pair of open substantially rectangular frames defining bottomless pockets adapted to receive the front wheels of a vehicle. Means, such as tiedown chains, and including improved chain locks are provided for holding the wheels down in the pockets.

3,611,950
MANICOTTI-MAKING MACHINE

Mario Battaglia, 440 North Taylor Ave., South Hackensack, and Frank Chessari, 471 Hudson St., Hackensack, both of N.J.

Filed Oct. 29, 1969, Ser. No. 872,078
Int. Cl. A21c 11/10
U.S. Cl. 107—1 A 6 Claims

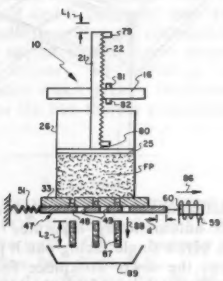


A manicotti-forming machine including means for forming a continuous sheet of dough from a mass thereof and conveying the dough sheet past a filler dispenser for depositing a controlled quantity of filler material onto the dough sheet, means cutting the dough sheet and deposited filler into increments of predetermined dimensions, and means folding the cut dough sheet about the deposited filler to form a completed manicotti unit ready for packing and shipping.

3,611,951
FOOD EXTRUDING MACHINE

Gordon E. Sloan, Anaheim, Calif., assignor to Logic Display Corporation

Filed Oct. 1, 1969, Ser. No. 862,757
Int. Cl. A01f 29/00, 35/22; A01d 55/02
U.S. Cl. 107—14 BA 14 Claims



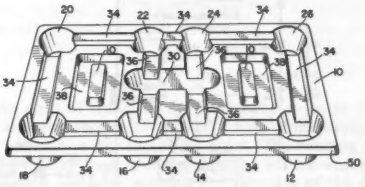
A food-extruding machine has a ram coupled to a piston that compresses moldable food product held in a container through aligned openings of a removable extrusion plate and a severing plate. When the severing plate is moved to shift the extrusion plate and severing plate openings out of alignment then the food product extrusions are chopped into chunks. The extrusion and severing cycle is repeated until the ram-driven piston has exhausted all the food product from the container.

The extrusion lengths may be varied by an adjustable control. The extrusion plate and a retaining recess for holding the extrusion plate have matched locating edges so that the extrusion plate openings and severing plate openings can be quickly and accurately aligned.

3,611,952
MOLDED PALLET

James H. Hoffman, Mansfield, Ohio, assignor to The Mansfield Tire and Rubber Company, Mansfield, Ohio

Filed Dec. 9, 1969, Ser. No. 883,481
Int. Cl. B65d 19/18
U.S. Cl. 108—51 4 Claims

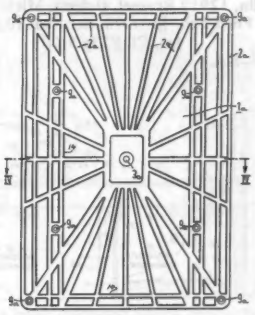


A one-piece, nestable, four-way molded pallet having a deck defining a load-supporting surface, a plurality of hollow pedestals formed integrally with the deck and a network of channels also formed integrally with the deck. The pedestals and channels depend downwardly from the deck to define depressions therein and are located in a preferred arrangement to provide maximum structural rigidity for the pallet.

3,611,953
ROTARY TABLE

Lorenz Schottl, 8 Munich 83, Sundergaustrasse 130, Munich, Germany

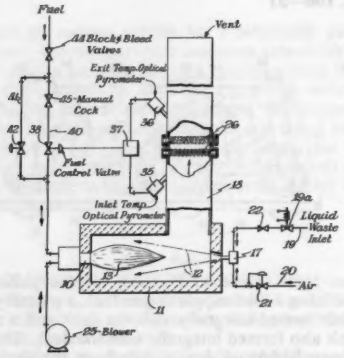
Filed May 14, 1969, Ser. No. 824,644
Int. Cl. A47b 11/00
U.S. Cl. 108—139 3 Claims



A rotary table which is particularly adapted for supporting a television receiver during assembly. The rotary table includes a pair of plates adjacently positioned and supported for relative rotation by means of a centrally located trunnion. The outwardly disposed surfaces of each of the plates are formed to define a plurality of radially extending bracing ribs. The outwardly disposed surfaces of at least one of the plates is provided with a plurality of blind holes. These holes are adapted to receive support members so as to allow the table to accommodate the lower surface of a television

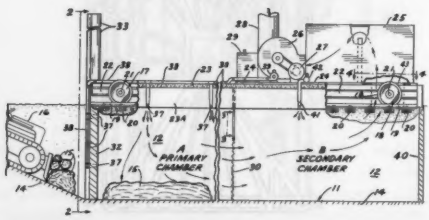
receiver which is nonuniform in shape. According to an alternate embodiment, the downwardly disposed plate is provided with a plurality of holes extending through the plate and equally spaced about a circular line. The upper plate is provided with an alignment hole. Thus, as the upper plate is indexed with respect to the lower plate, each of the holes in the lower plate are selectively aligned with the alignment hole so as to permit mounting screws to be passed therethrough.

3,611,954
OXIDATIVE WASTE DISPOSAL
Elmer S. Monroe, Jr., Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed May 8, 1970, Ser. No. 35,604
Int. Cl. F23g *5/12*
U.S. Cl. 110—7 R **5 Claims**



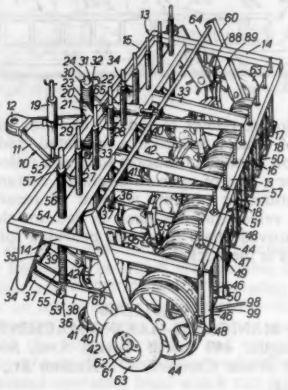
Process and apparatus for oxidative disposal of organic wastes heavily diluted with water by (1) vaporizing the dilute organic waste stream by directly heating waste sprayed counter to a combustion flame in a general envelope pattern and (2) catalytically oxidizing the hot vaporized effluent from the combustion flame to equilibrium products.

3,611,955
METHOD AND MEANS FOR INCINERATING SOLID WASTE
Samuel Nimlin, 12919 Bramel, Detroit, Mich.
Filed Feb. 11, 1970, Ser. No. 10,556
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 A **7 Claims**



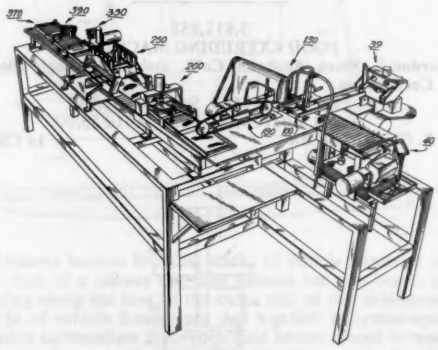
Method and means for disposing of solid waste by using a portable incinerator, in conjunction with a continuous sanitary landfill trench. The method consists of progressively incinerating the waste within the trench with a portable incinerator, and then covering the solid residue, after combustion, with a sanitary landfill. The means consist, in general, of a refractory cap having depending side and end members, which progressively compartmentize areas of the trench with means to sustain combustion in the compartments, means to scrub the combustion gases, and means to move the entire assembly along the trench.

3,611,956
MEANS FOR AGRICULTURAL SEEDING
Samuel Moore, Antrim, Northern Ireland, and Frank E. Jones, Shropshire, England
Filed July 15, 1969, Ser. No. 841,806
Claims priority, application Great Britain, July 20, 1968, 34,711/68
Int. Cl. A01c *5/06, 7/08;* **A01h** *63/00*
U.S. Cl. 111—62 **5 Claims**



In agricultural sowing of seeds, seeds are delivered through tubes to slits cut in the ground by a plurality of discs. At least one roller is adapted to compact the ground and close the slits after seeds have been implanted in the slits. The discs and the rollers are carried by arm assemblies mounted on a frame connected to a drawbar and a resilient connection is adjustable to effect relative movement between the frame and the drawbar in a vertical plane to vary the loading applied to the discs.

3,611,957
POCKET BLANK FORMING MACHINE
Aubrey G. Beazley, El Paso, Tex., assignor to Farah Manufacturing Company, Inc., El Paso, Tex.
Filed Jan. 26, 1970, Ser. No. 5,809
Int. Cl. D05b *33/00*
U.S. Cl. 112—121.29 **16 Claims**

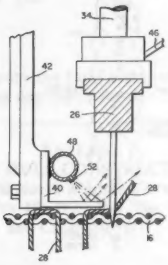


An automatic pocket blank sewing machine has been provided which automatically separates and feeds a single pocket blank ply, a single facing patch ply, mates these two, sews, removes the sewn workpiece for folding the facing patch to hide its stitch line, folds the longitudinal edge seams (for subsequent sewing), folds the pocket blank ply to form a pocket pouch and then removes and stacks the folded pocket blank pouch.

3,611,958
APPARATUS FOR THE MANUFACTURE OF TUFTED FABRICS

James C. Rutledge, Calhoun, Ga., assignor to Collins & Aikman Corporation, New York, N.Y.

Filed Aug. 5, 1969, Ser. No. 847,623
Int. Cl. D05c *15/00*
U.S. Cl. 112—79 R 1 Claim

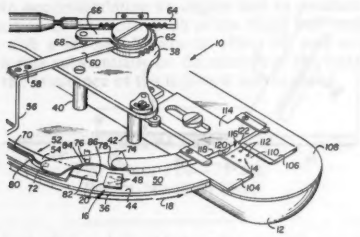


An improved method and apparatus is provided for the manufacture of tufted fabrics in which the tufting needles and pile yarns adjacent to the needles are contacted with a mixture of air and atomized water to both cool the needles and substantially reduce or eliminate the electrostatic charge on the yarn.

3,611,959
LABEL-FEEDING ATTACHMENT

Neal Parlatore, Laurelton, and Antonio Tomasello, Yonkers, both of N.Y., assignors to Gellman Industries, Inc., New York, N.Y.

Filed Mar. 13, 1970, Ser. No. 19,306
Int. Cl. D05b *3/12, 3/20*
U.S. Cl. 112—104 9 Claims



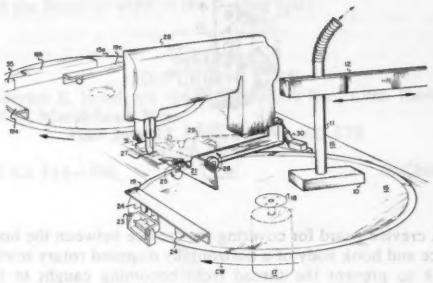
A sewing machine attachment for working the bottom of a supply stack of labels so that the individual labels thereof are delivered, one at a time, to a sewing station. Each label is supplied folded in half and is delivered from an out-of-the-way supply station which, neither by obstruction nor otherwise, interferes with the sewing operation. Moreover, simultaneously with its delivery, an unfolding movement is produced in each label which greatly facilitates the placement of a garment or the like therein preparatory to sewing attachment thereof.

3,611,960
ROTATING PLATE WORKPIECE ORIENTING AND POINT-TO-POINT FEEDING APPARATUS

Frederick Klein, Norwalk, Conn., assignor to Ivanhoe Research Corporation, New York, N.Y.

Filed May 11, 1970, Ser. No. 36,366
Int. Cl. D05b *33/00*
U.S. Cl. 112—121.29 10 Claims

A rotating plate is positioned in the work surface of a tool, in substantially the same plane, adjacent to the work point. Tangential guide stops are positioned so as to intercept workpieces carried by the rotating plate. The interception of the workpieces being carried by the rotating plate creates vector forces which act upon the workpiece, causing a change in the position and orientation of the workpiece with respect to the tool and, according to the relative position of the guide stop.

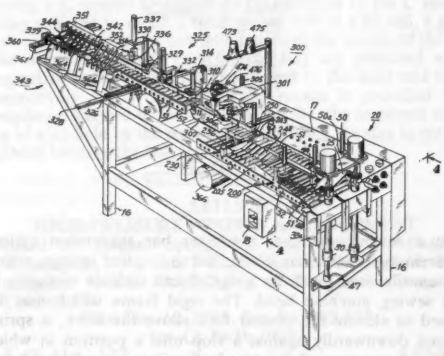


changes the path of travel of the workpiece so as to orient the workpiece and present sequential points of the workpiece in registered relationship to a work point. The rotating plate remains the motive force but the steering of the workpiece into a new path and new position is a function of the guide stop plus the motive force of the rotating plate.

3,611,961
AUTOMATIC WELTING PATCH AND LINER ASSEMBLER AND SEWING DEVICE THEREFOR

Enrique Lopez; Robert D. Spidle, and Aubrey Glenn Beazley, all of El Paso, Tex., assignors to Farah Manufacturing Company, Inc., El Paso, Tex.

Filed June 9, 1970, Ser. No. 44,710
Int. Cl. D05b *33/00*
U.S. Cl. 112—121.11 17 Claims

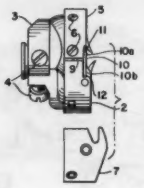


A machine has been disclosed which produces from a facing patch blank and a stiffener blank for it a facing patch used for a welt defining the outlines of a pocket. The machine performs the feeding of each individual patch, a patch inverting, the patch mating as well as sews the facing patch and its stiffener together, severs one sewn patch from the other, marks two successive, correctly related patches with the same number and stacks the patches with the same number into two different receptacles. The machine is automatically operated and sequentially interlocked; a circuit with an operating mode and an alarm mode is provided for the machine. As a result, numerous manual steps have been eliminated, better workpieces obtained, as well as sequentially more correct lots of the facing patches obtained.

3,611,962
CREVICE GUARD FOR HORIZONTALLY DISPOSED ROTARY SEWING HOOK

Samuel Armao, 447 S. Fifth St., Reading, Pa.

Filed June 29, 1970, Ser. No. 50,818
Int. Cl. D05b *57/14*
U.S. Cl. 112—228 7 Claims

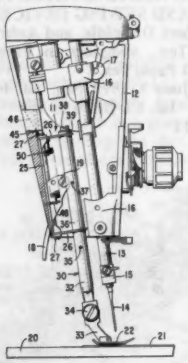


A crevice guard for covering the crevice between the hook piece and hook body of a horizontally disposed rotary sewing hook to prevent the thread from becoming caught in the crevice and torn or interrupted in its movement during a stitching cycle.

3,611,963
PRESSER BAR SUSPENSION SYSTEMS

John A. Herr, Garwood, and Robert B. Brauch, Wayne, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Apr. 22, 1970, Ser. No. 30,858
Int. Cl. D05b *29/00*
U.S. Cl. 112—235 4 Claims



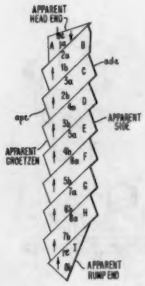
In a sewing machine, a presser bar suspension system wherein the presser bar is attached to two leaf springs, which are cantilevered out from a rigid frame slidable vertically in the sewing machine head. The rigid frame which may be raised to elevate the presser foot above the work, is spring biased downwardly against a stop into a position in which only the pressure of the two leaf springs urges the presser foot against the work.

3,611,964
COMPOSITE FUR-BEARING PELT AND METHOD OF FABRICATION THEREOF

Carl P. Piampiano, 2601 Wadsworth Road, Zion, Ill.

Filed May 11, 1970, Ser. No. 36,127
Int. Cl. D05b *93/00*
U.S. Cl. 112—401 22 Claims

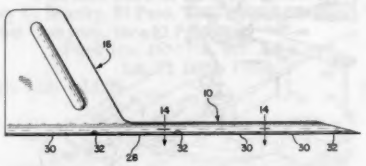
Letout, reassembled and sewn composite fur-bearing pelt composed of a plurality of separate pieces, e.g. relatively narrow strips, cut from the same natural pelt having the slant, i.e. flow or lay, of the fur hair thereof extending in a direction substantially rearwardly from the normal head end of the pelt to the rump end thereof, including such pieces sewn together in reassembled relation, e.g. offset lengthwise with respect to one another, in the same positional sequence but individually reversed in orientation by rotation approximately one-half turn and having the slant of the hair of each such reversed piece extending in a direction substantially forwardly from the resultant apparent rump end of the composite pelt to the resultant apparent head end thereof; and method of fabrication of composite pelt consonant therewith by letting out, reassembling and sewing such pieces in said same positional sequence but individually reversed in orientation by rotation about one-half turn.



3,611,965
DETACHABLE GUIDE NEEDLE

Carl W. Lange, Des Plaines, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed June 2, 1969, Ser. No. 829,634
Int. Cl. B21d *53/06*; A61m *05/00*
U.S. Cl. 113—116 6 Claims



Methods of forming detachable guide needle devices which are utilized in conjunction with flexible catheters in withdrawing or introducing fluids relative to a body, said method including the stamping of a guide needle blank, the impression of break-apart hinge means therein, and the folding thereof in a manner which will provide separation of the guide needle into detached sections after use thereof for complete removal from an associated flexible catheter.

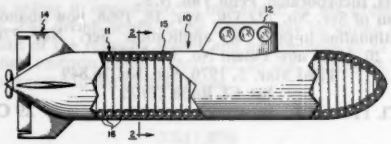
3,611,966
SUBMERSIBLE VEHICLE WITH MULTIPLE TUBULAR RING HULL

Frank Baldwin Hunter, 24042 Friar St., Woodland Hills, Calif.

Filed June 4, 1969, Ser. No. 830,229
Int. Cl. B63g *8/00*
U.S. Cl. 114—16 12 Claims

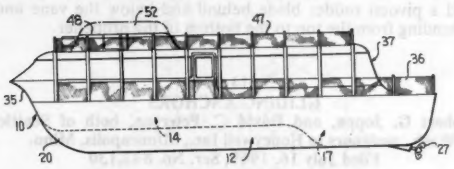
A submersible vehicle hull section is fabricated from a series of consecutively aligned tubular rings that are joined together on a common axis and are filled with pressurant material. The material internal pressure operates to pretension the rings for counteracting intense depth pressures exerted by ocean water upon the vehicle. When the pressurant

material is fluid a fluid pressure regulating system may be coupled in fluid communication with the tubular rings in



order to selectively vary the fluid pressure inside the rings to accommodate varying depth pressures.

3,611,967
BOAT HULL CONSTRUCTION
David W. Bossler, 820 North Montana Ave., Helena, Mont.
Filed May 19, 1970, Ser. No. 38,681
Int. Cl. B63b *1/10*
U.S. Cl. 114—61 **15 Claims**

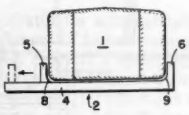


This disclosure relates to a boat hull which includes two widely spaced lateral hull sections which are connected together in the forward and midship portions thereof by a bridging section which is normally disposed well out of the water when the boat is moving forward. The bridging section is a portion of a central hull with the aft part of this central hull being in the form of an inner hull section of a cross section similar to adjacent portions of the lateral hulls and capable of both accommodating an engine and to produce lift to the aft portion of the boat. Each of the three hull sections is provided with a ski-type bottom to effect lift and to permit the hull to ride substantially on the surface of the water, thus reducing the resistance of the hull as it moves along.

ERRATUM

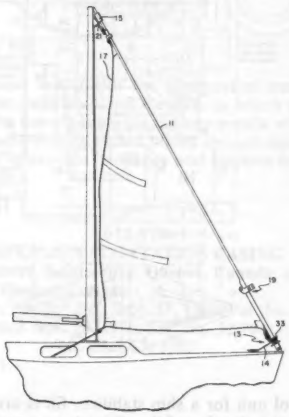
For Class 114—77 see:
Patent No. 3,611,610

3,611,968
WATERTIGHT FLOATING BOXES FOR UNDERWATER WORK ON FLOATING BODIES
Isoe Takezawa, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sept. 9, 1969, Ser. No. 856,320
Claims priority, application Japan, Sept. 12, 1968, 43-65694
Int. Cl. B63b *3/02*
U.S. Cl. 114—77 R **7 Claims**



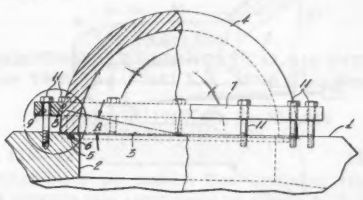
A watertight floating box, for use in working on floating bodies such as ship sections or the like to be assembled, disassembled, repaired, or maintained while afloat comprises caisson means arranged to embrace, in watertight manner, the underwater portions of the floating body and arranged to be pumped free of water to provide a dry working space along the underwater portions of the floating body. The caisson means includes a bottom structure to extend horizontally and transversely across the bottom of the floating body and sidewall structures extending substantially vertically upwardly in facing relation with the sidewalls of the body. The sidewall structures are arranged for adjustment relative to each other transversely of the floating body in accordance with the beam or width of the floating body.

3,611,969
JIB-FURLING STAY
Frederick E. Hood, c/o Wood Sailmakers Inc., Little Harbor Way, Marblehead, Mass.
Filed June 23, 1969, Ser. No. 835,579
Int. Cl. B63h *9/04*
U.S. Cl. 114—106 **10 Claims**



The jib-furling apparatus disclosed herein employs a stay having a C-shaped cross section, the interior of the C shape being adapted to retain a bead on the luff of a jib sail, e.g. a bolt rope, with the sail extending through the mouth of the C. The upper and lower ends of the stay are provided with respective swivel means for attachment to the mast and bow respectively and a further swivel means is provided for coupling a halyard to the head of a jib thereby to permit raising of a jib held by the stay while permitting the stay to rotate without twisting the halyard around the stay.

3,611,970
HIGH-PRESSURE WINDOW ARRANGEMENT
Richard H. Hagan, Springfield, Pa.; Lewis C. Hazlett, Wilmington, Del., and William Watson, Wallingford, Pa., assignors to Sun Shipbuilding & Dry Dock Company, Chester, Pa.
Filed Dec. 10, 1969, Ser. No. 883,833
Int. Cl. B63b *19/00*
U.S. Cl. 114—177 **4 Claims**



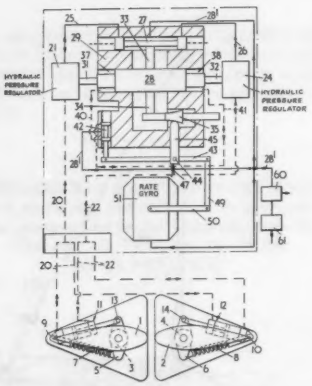
A transparent viewing window for high-pressure use, e.g. in a submarine, is made of an organic thermoplastic material

and has the form of a hemispherical shell. The window is secured in place covering an opening in the submarine hull or skin by means of a clamping ring which engages the outer surface of the window and is bolted to the hull. An O-ring provides a low-pressure seal between the window and the skin of the submarine.

3,611,971
CONTROL OF MOVING SURFACES

Roger Edward Gwynn, Catford; Michael John Turnham, Anerley, and Alexander Arthur Tann, West Wickham, all of England, assignors to Muirhead Limited Beckenham, Kent, England

Filed May 23, 1969, Ser. No. 827,278
Claims priority, application Great Britain, May 29, 1968, 25692/68
Int. Cl. B63b *39/06*
U.S. Cl. 114—126 **6 Claims**

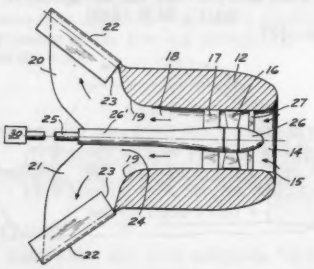


A control unit for a ship stabilizer fin is arranged to provide a signal indicative of the tilting torque applied to the fin and which is modified by a cam to provide a signal which varies the output of a roll-velocity sensing gyro which controls the fin settings. The change in the center of pressure of the fin which change in angle of attack can thus be compensated for. The invention has utility in the field of small ship stabilizers such as yacht stabilizers.

3,611,972
SHIP WATER JET DIRECTIONAL CONTROL AND BRAKING MEANS

Jacques P. Duport, Montbonnot Par Saint-Ismier, France, assignor to Societe Grenobloise d'Etudes et d'Applications Hydrauliques (SOGREAH), Grenoble, France

Filed Mar. 20, 1969, Ser. No. 808,965
Claims priority, application France, Mar. 21, 1968, 5,236
Int. Cl. B63h *25/46*
U.S. Cl. 114—151 **8 Claims**

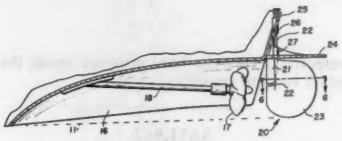


Water jets are discharged from the front of the ship by a pump installed in a Y-shaped duct into which the water flows longitudinally, centrally of the ship and from which the flow discharges on the two opposite sides of the hull.

3,611,973
RUDDER ASSEMBLY

Robert B. Stuart, Penn Yan, N.Y., assignor to Penn Yan Boats, Incorporated, Penn Yan, N.Y.

Division of Ser. No. 722,320, Apr. 18, 1968, now abandoned, Continuation-in-part of application Ser. No. 776,829, Oct. 20, 1968, now Patent No. 3,515,087.
Filed Mar. 5, 1970, Ser. No. 16,849
Int. Cl. B63h *25/06*
U.S. Cl. 114—162 **29 Claims**

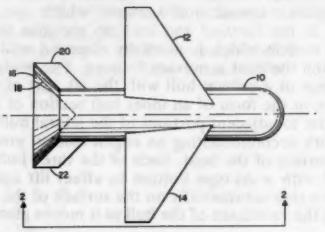


A rudder assembly for high-speed, planing hulls includes a spray plate extending aft of the stern at the waterline, a propeller forward of the spray plate, a fixed vane extending downward from the spray plate to the center of the propeller, and a pivotal rudder blade behind and below the vane and extending from the top to the bottom of the propeller.

3,611,974
GLIDING ANCHORS

Robert G. Joppa, and David C. Peterson, both of Seattle, Wash., assignors to Honeywell Inc., Minneapolis, Minn.

Filed July 16, 1969, Ser. No. 842,130
Int. Cl. B63b *21/24*
U.S. Cl. 114—206 R **1 Claim**

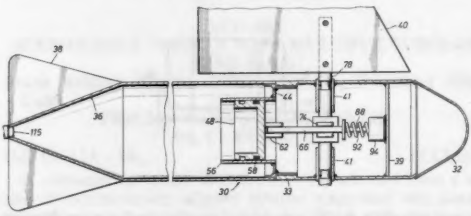


A gliding anchor for use in an automatic anchor deployment system wherein one or more anchors are launched from a fluid-supported device. Each anchor is designed to glide at a given angle from the deploying device to the bottom of the fluid container where it rests and provides anchor for the deploying device.

3,611,975
PARAVANE DEVICE

Clifford Logan Ashbrook, 5077 Cheena, Houston, Tex.

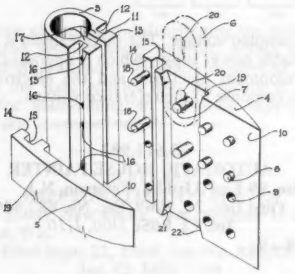
Filed Aug. 15, 1969, Ser. No. 850,555
Int. Cl. B63b *21/56, 17/00*
U.S. Cl. 114—235 B **8 Claims**



A paravane for maintaining a seismic cable being towed through the water at a predetermined distance above the water floor. The paravane includes a cylindrical body characterized by diametrically opposed wing members actuated by

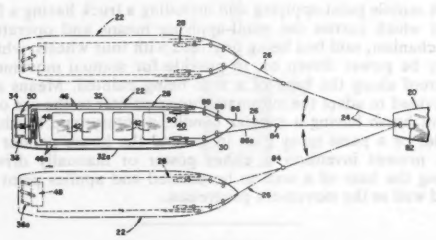
an air pressurized piston which moves the wing members into an ascending or descending position. Predetermined operating depths of the paravane is accomplished by resisting spring means acting in opposition to movement of the pressurized piston. The diving depth of the device may be varied by adjustment of the resisting means and air pressure so as to accomplish uniform depth control of all the paravanes which are connected to the seismic cable.

3,611,976
LOW-DRAG FAIRING CONFIGURATION FOR FLEXIBLE TOWING CABLES
Neville E. Hale, Port Credit, Ontario, and Kenneth Gardner, Mimico, Ontario, both of Canada, assignors to Fathom Oceanology Limited, Port Credit, Ontario, Canada
Filed Nov. 12, 1969, Ser. No. 875,864
Claims priority, application Great Britain, Nov. 23, 1968, 55708/68
Int. Cl. B63b *21/00*
U.S. Cl. 114—235 F **7 Claims**



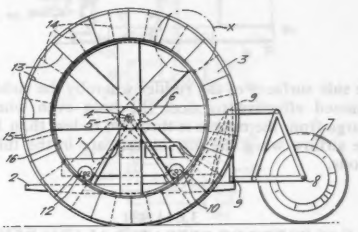
A cable fairing has a flexible hollow nose and a rigid tail; the fairing is in short sections with each adjacent pair connected by flexible pivotal links.

3,611,977
SYSTEM AND APPARATUS FOR AUTOMATICALLY STEERED TOWED VESSELS
Inge Gordon Mosvold, P.O. Box 58, Freeport, Bahamas
Continuation-in-part of application Ser. No. 706,968, Feb. 20, 1968, now abandoned. This application Dec. 3, 1969, Ser. No. 881,938
Int. Cl. B63b *21/00*
U.S. Cl. 114—236 **26 Claims**



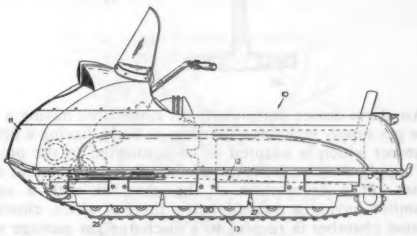
A system and apparatus for automatically steering vessels under tow by employment of forces transmitted through tow cables that operatively connect a vessel being towed with its towing vessel so that the towed vessel travels substantially in the path of the towing vessel, by automatic rudder changes at various turning speeds to accommodate for changes in course while being towed. The tow cables from the towing vessel are operatively connected on the towed vessel to a towing and steering mechanism that allows the cables to effect rotation and/or translation of a pinion mechanism that is operatively connected to and controlled by a rudder turning means to effect turning of the rudder or rudders on the towed vessel when changes in course are required.

3,611,978
AMPHIBIOUS VEHICLES
Robert Gray, Furret Cottage, Fishbourne Green, near Ryde, England
Filed Sept. 4, 1969, Ser. No. 855,277
Claims priority, application Great Britain, Sept. 4, 1968, July 24, 1969, 42,121/68;37,360/69
Int. Cl. B63h *21/12*
U.S. Cl. 115—0.5 A **6 Claims**



An amphibious vehicle for the transport of cars or light vans over water, soft mud and the like, in which the car or van supplies the driving force for the two paddle wheels. The paddle wheels have open ended boxed around their circumferences so as to provide buoyancy and traction for the amphibious vehicle.

3,611,979
SUSPENSION FLOATATION CASING
Maurice E. Hebert, Sainte-Foye, Quebec, Canada, assignor to Nanuk Inc., Quebec, Canada
Division of Ser. No. 763,265, Sept. 27, 1968, Pat. No. 3,534,701
Filed Apr. 28, 1970, Ser. No. 32,704
Int. Cl. B63f *3/00*
U.S. Cl. 115—1 **7 Claims**

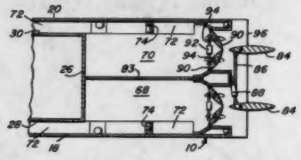


A suspension for an amphibious vehicle having a buoyant body and a pair of drivable endless tracks. The suspension comprises a flotation casing disposed between the upper and lower travel of each of the tracks and secured to the vehicle frame for resilient displacement thereof to absorb shocks. A plurality of boggey wheels are secured to the underside of the casing to support the vehicle off the ground.

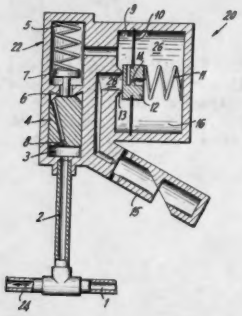
3,611,980
AMPHIBIOUS BOAT WITH VERTICAL AIR SHUTTER
John Van Veldhuizen, 31601 S.W. 197th Ave., Homestead, Fla.
Filed Sept. 18, 1969, Ser. No. 859,069
Int. Cl. B63h *11/00*; **B63b** *1/34*
U.S. Cl. 115—12 **12 Claims**

An amphibious air cushion boat including rearwardly opening opposite side compressed air outlets each having a centrally located vertical air rudder operatively associated therewith for steerage of the boat. Each of the outlets is provided with a pair of movable and controlled air shutters upstream from the associated air rudder and operable to throttle the discharge of air from the outlet in a manner such that

the rudder is maintained centered in the air discharge from the outlet throughout the full range of movement of the air shutters from the full open positions thereof to substantially fully closed positions thereof and the air being discharged from the outlet, when partially throttled, is directed on opposite side surfaces of the rudder whereby the rudder will be maintained effective to steer the boat even when the air discharge from the outlets is throttled to less than 10 percent of the airflow when the air shutters are in the fully opened positions.



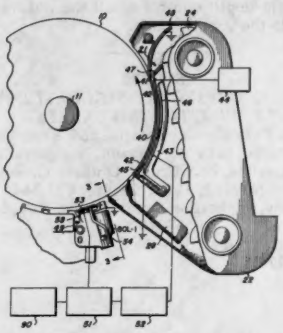
3,611,981
GAS PRESSURE OPERATED ALARM DEVICE
Ernst Warncke, Lubeck, Germany, assignor to Dragerwerk AG, Lubeck, Germany
Filed Nov. 2, 1970, Ser. No. 86,186
Int. Cl. G01l *19/12*
U.S. Cl. 116—70 **6 Claims**



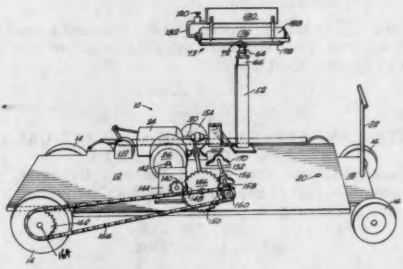
An alarm device particularly for respirators having a pressure gas supply includes a housing, or body, having a first gas chamber which is adapted to be connected to the pressure gas supply. A valve is movable in the first gas chamber and it closes off a connection of the chamber with a second chamber having a second valve therein which closes the second chamber in respect to a discharge gas passage which connects to a signaling device such as gas operated whistle. A spring biases the first valve toward an open position and when the gas pressure in the line reduces, it opens the first valve and permits flow of the gas under pressure into the second chamber until it pressurizes sufficiently to open the second valve to permit the gas to flow to the signaling device and actuate the whistle. The second valve includes a control device defining a throttle passage which permits flow from a connecting chamber portion of the second chamber on one side of the second valve into an equalizing chamber portion on the other side of the second valve. After some time, the pressure equilibrium is again established in the second gas chamber to close the second valve again and to stop the flow of gas to the signaling device.

3,611,982
DEVELOPMENT ELECTRODE CONTROL APPARATUS
Samuel Coriale, Webster, N.Y., and Ned J. Seachman, Penfield, N.J., assignors to Xerox Corporation, Rochester, N.Y.
Filed Aug. 29, 1969, Ser. No. 854,086
Int. Cl. G03g *13/08*
U.S. Cl. 118—4 **7 Claims**

Apparatus is herein disclosed for controlling the quality of image development produced by a xerographic developing apparatus. Circuit means are provided to periodically sample a reference voltage on an exposed xerographic plate prior to image development and to provide an output signal indicative of the sampled voltage. The output signal is then applied to an adjustable power supply which is operatively connected to the development electrode and the electrode potential regulated in response to the reference voltage.



3,611,983
AUTOMATIC HOUSE PAINTER
John D. Wise, 99 East 33rd St., Paterson, N.J.
Filed Dec. 24, 1969, Ser. No. 887,806
Int. Cl. B05c *5/00, 1/10*
U.S. Cl. 118—9 **11 Claims**

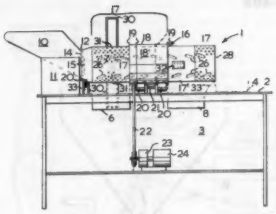


A mobile paint-applying unit including a truck having a flat bed which carries the paint-applying means and operating mechanism, said bed being provided with four wheels, which may be power driven or, to provide for manual movement thereof along the base of a wall being painted. Means are provided to adapt the automatic house painter to the use of a paint brush having a tubular handle, a rotary-type brush, a roller or a paint spray gun. In general the house painter of the present invention is either power or manually driven along the base of a wall to be painted and applies paint to said wall as the movement progresses.

3,611,984
COATING MACHINE
Raymond H. Angold, 179 Fairway Hill Crescent, Kingston, Ontario, Canada
Filed July 29, 1969, Ser. No. 845,729
Claims priority, application Canada, Apr. 21, 1969, 049,248
Int. Cl. B05c *5/00*
U.S. Cl. 118—19 **13 Claims**

A coating apparatus is described, particularly for use in applying a coating of edible material onto an article of food. The food is introduced into the interior of a slowly rotating drum, preferably removably mounted, where it is tumbled and conveyed through the drum by number of vanes or paddlelike members. These vanes are separated one from

another to prevent them from trapping and carrying any coating material downstream in the drum. The drum has at least one coating zone which, preferably, has a perforated area therein. A plurality of dished-out members or scoops are provided in each coating zone, exteriorly of the drum for picking up a predetermined quantity of the coating material



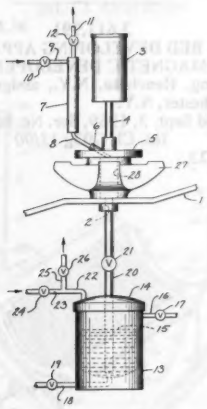
from a source of supply and distributing the same by gravity onto the food articles being tumbled within the drum. In preferred forms, automatically operable devices are provided for feeding the food articles into the drum at a controlled rate, and for maintaining an adequate supply of coating material in said source of supply.

3,611,985

IMPREGNATING APPARATUS

Thomas W. Juday, New Berlin, Wis., assignor to Imprex, Inc., Greenfield, Wis.

Filed Sept. 22, 1969, Ser. No. 859,959
Int. Cl. B05c 7/00
U.S. Cl. 118—50 **5 Claims**



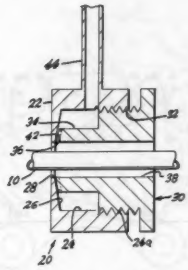
An apparatus for impregnating a liquid sealant into the bore surface of a wheel hub or the like includes a sealant reservoir with an outlet line leading to the bore and a closed manifold leading from the bore. The manifold and outlet line communicate with the bore through openings in a work surface and a hydraulically actuated platen which together clamp the hub in place and seal off the ends of the bore. During impregnating, the reservoir is pressurized to force sealant through the outlet line into the bore and manifold, and air is trapped in the manifold and compressed until a desired system pressure is reached. After a suitable time, the pressure in the reservoir is released, and the trapped air expands to cause the sealant to move quickly back to the reservoir.

3,611,986

APPARATUS FOR FINISHING METALLIC COATINGS

Marvin B. Pierson, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Division of Ser. No. 708,598, Feb. 27, 1968, Pat. No. 3,533,761
Filed Mar. 25, 1970, Ser. No. 022,423
1970, Ser. No. 022,423
Int. Cl. B05c 11/06
U.S. Cl. 118—63 **5 Claims**



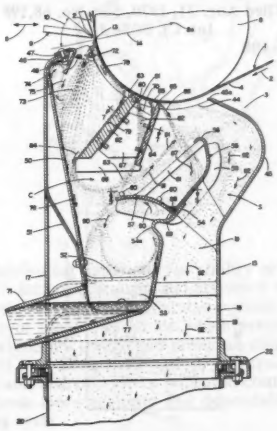
Apparatus for finishing a molten metallic coating on a cylindrical strand wherein a swirling gas jet is directed at a moving strand carrying still molten coating metal so as to remove excess coating metal and break up pneumatically the oxide skin on the coating metal into small, uniformly distributed particles, including a nozzle having a plurality of slots equally spaced about the strand pass line and directed tangentially toward a strand passing therethrough.

3,611,987

PAPER COATER BLOWOFF APPARATUS

John B. Kohler, and Wallace E. Green, both of North Canton, Ohio, assignors to The Kohler Coating Machinery Corporation, Greentown, Ohio

Filed Sept. 8, 1969, Ser. No. 856,100
Int. Cl. B05c 11/06
U.S. Cl. 118—63 **15 Claims**



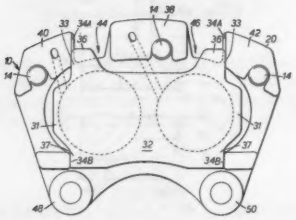
A paper coater for providing a uniform coating on the surface of a traveling web using an air knife to control the coating thickness and finish, having a blowoff box and related separator and suction mechanisms arranged to completely trap, collect and separate the mist and its components resulting from air knife operation. The blowoff box has a number of vortex suppressor means and spoilers cooperatively related to deliver coating material for return to the coating material supply tank and to collect mist and separate its waste components and air for discharge respectively, to sewer and atmosphere, eliminating mist discharge into the environs of the paper-making machinery of which the coater forms a part.

3,611,988

PARALLEL ABUTMENTS AND CIRCUMFERENTIALLY EXTENDED PADS

Wolfgang Hess, Oberer Bassenheimer, Germany, assignor to Girling Limited

Filed June 12, 1969, Ser. No. 832,766
Claims priority, application Great Britain, June 26, 1968, 30,555/68
Int. Cl. F16d 55/228
U.S. Cl. 188—72.5 2 Claims



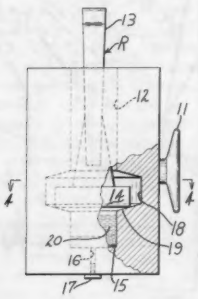
In a vehicle disc brake comprising a caliper structure adapted to straddle the brake disc, each of the two parts of the caliper, which lie on opposite sides of the disc being formed with surfaces extending perpendicular to the plane of the disc for guiding one of a pair of opposed brake pads, the pad-guiding surface at each of the circumferentially spaced ends of each pad is divided into two separate coplanar portions with a gap between them and the pad is so shaped and dimensioned that at each end it projects circumferentially outwards beyond the plane of the respective guiding surface, through the gap between the two portions thereof.

3,611,989

RECEPTACLE FOR SAFETY RAZORS

William F. Lovelace, 299 North Banana River Dr., Merritt Island, Fla.

Filed Aug. 31, 1970, Ser. No. 68,198
Int. Cl. B05c 3/02
U.S. Cl. 118—400 1 Claim



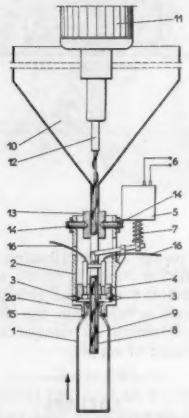
A receptacle for safety razors in the form of a container which may be mounted on a wall and having a well therein adapted to receive the head of the razor. A supply of lubricant is maintained in the bottom of the well so that when the razor is placed therein the blade is prevented from rusting and is lubricated, to facilitate shaving. The well also is provided with a shelf just above the level of the lubricant to support the razor, to permit excess lubricant thereon to drain back into the well prior to using the razor.

3,611,990

APPARATUS FOR PLASTIC LINING CONTAINERS FOR AEROSOLS

Charles Paoletti, Aulnay-sous-Bois, and Gilles Terrasse, Deuil-la-Barre, both of France, assignors to Societe anonyme dite: L'Oreal, Paris, France

Filed July 22, 1969, Ser. No. 843,617
Claims priority, application France, Aug. 13, 1968, 162,937
Int. Cl. B05c 7/00
U.S. Cl. 118—408 5 Claims



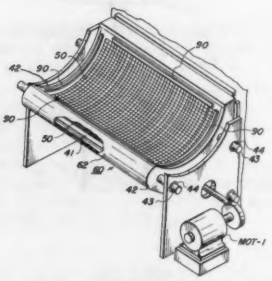
A fluid containing a polymerizable film forming substance is introduced into a container so as to adhere to the inner walls thereof. The nonadhering portion of the liquid is then withdrawn and the remainder polymerized in situ on the inner surface of the container. Alternatively, the container is a mold coated with a parting compound and the film formed therein is separated from said mold after polymerization.

3,611,991

VIBRATING BED DEVELOPING APPARATUS WITH ELECTROMAGNETIC DEVELOPER AGITATOR

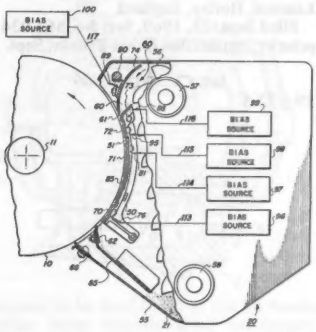
Eugene F. Young, Henrietta, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Sept. 3, 1969, Ser. No. 854,838
Int. Cl. G03g 13/00
U.S. Cl. 118—623 4 Claims



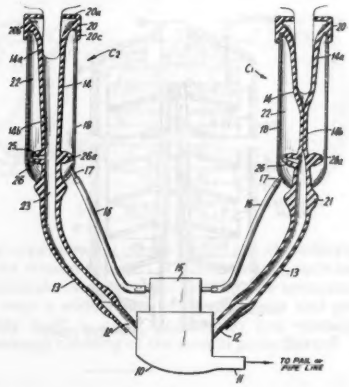
Apparatus for developing electrostatic latent images carried by a support medium with a vibrating bed of two-component magnetizable developer material. The development unit includes a housing, containing developer material, positioned adjacent a latent image-bearing support medium and vibrated to convey the developer material into contact with the latent image for effecting the development thereof. A plurality of electromagnets are carried by the inner peripheral surface of the developer housing and sequentially actuated to, in combination with the vibratory movement effect intermixing of the developer material.

3,611,992
CLEANUP ELECTRODE
James M. Lyles, Fairport, and Glenn L. Hilt, Webster, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed July 3, 1969, Ser. No. 838,914
Int. Cl. G03g 13/00
U.S. Cl. 118—637 6 Claims



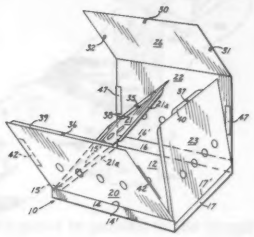
An electrically biased electrode for preventing the formation of toner powder clouds and for cleaning unwanted background development from a member supporting an electrostatic image, the member moving in opposition to a flow of two-component developer material.

3,611,993
VALVING ARRANGEMENT FOR OPERATING TEAT CUP LINERS
Douglas J. Norton, Red Hook, N.Y., assignor to The DeLaval Separator Company, Poughkeepsie, N.Y.
Filed Nov. 10, 1969, Ser. No. 875,360
Int. Cl. A01j 05/04
U.S. Cl. 119—14.36 17 Claims



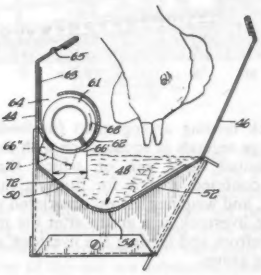
Below its teat-receiving portion, the liner is provided with an orifice through which air is sucked into the liner when it is collapsed by flow of air into the surrounding pulse space within the shell, so that interruption of the latter flow causes the liner to return to its normal position as the pressures within the liner and the surrounding space tend to equalize due to the orifice; and valve means are provided for closing this orifice when the liner is in its normal position, thereby preventing leakage of milk from the liner into the surrounding pulse space.

3,611,994
FOLDABLE ANIMAL SHIPPING CONTAINER
Everett R. Bailey, 1575 Spruce Street, Denver, Colo.; Frank J. Dreckman, 2967 W. Tanforan Drive, Englewood, Colo., and William S. Gass, 215 Woodlawn Avenue, Sumpter, S.C.
Filed Aug. 13, 1969, Ser. No. 849,728
Int. Cl. A01k 01/00, 01/02
U.S. Cl. 119—17 7 Claims



A foldable shipping container, having a rigid bottom, has four short upstanding sides of different height, and a hinged wall on each of said short sides cooperatively form an enclosure with one of said walls including a hinged top; all of the walls interlocking forming a rigid releasable container, and releasable fastening means secures the top to the other three sides.

3,611,995
TROUGH-TYPE POULTRY FEEDERS
Robert A. Murto, Goshen, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.
Filed Sept. 3, 1969, Ser. No. 854,855
Int. Cl. A01k 05/00
U.S. Cl. 119—18 30 Claims

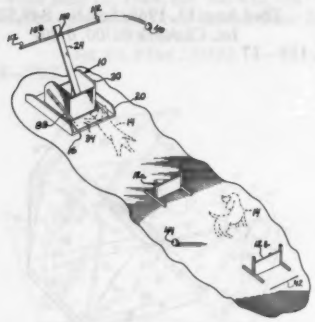


Feed-distributing apparatus for poultry or the like, of the type which include a trough, and conveyor means supplying feed to said trough. The apparatus provide a novel trough and conveyor tube construction which precludes packing of the feed within the trough and promotes more even distribution of said feed along the length of said trough. In addition, said apparatus also provide an improved control arrangement which affords more accurate and dependable regulation of the feeding cycle.

3,611,996
ANIMAL-TRAINING FLYBALL APPARATUS
Herbert O. Wegner, 200 North Ave. 64, Los Angeles, Calif., assignor to Herbert O. Wegner and Martha Wegner, La Canada, Calif.
Filed Aug. 29, 1969, Ser. No. 854,186
Int. Cl. A01k 15/00; A63b 65/00, 69/40
U.S. Cl. 119—29 2 Claims

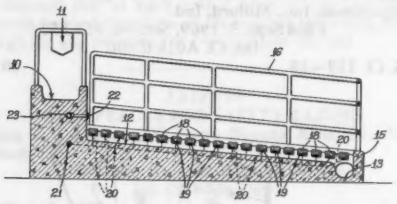
The invention provides an animal-training apparatus for hurling a ball into space upon being actuated by the dog who then attempts to catch the ball in his mouth before the ball

strikes the ground and return the ball to the trainer or some other agreed point. The apparatus when used in team play is placed at the end of a predetermined number of hurdles of variable height. Scoring depends on whether the ball is



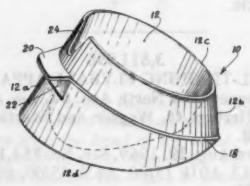
caught in midair or on the first, second or more bounces and whether all required hurdles are in fact cleared by the dog with the winning team being the one with the highest score in a fixed time period.

3,611,997
LIVESTOCK FEEDING ARRANGEMENT
Edward L. Benno, Route 1, Box 198, Grayslake, Ill.
Filed Aug. 27, 1969, Ser. No. 853,266
Int. Cl. A01k *01/00, 05/00*
U.S. Cl. 119—51 R **3 Claims**



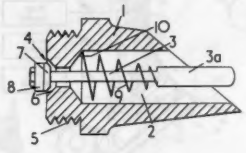
A livestock feeding arrangement for feeding a group of relatively large animals in accordance with their weight comprising a slatted floor pen on which the livestock are completely confined, means for flushing manure from the slatted floor, and weighing means associated with the slats for weighing the livestock as a group after the manure has been flushed therefrom and feeding the livestock according to the weight of the group.

3,611,998
PET FEEDING BOWL
Nicholas R. Loscalzo, Melville, N.Y., assignor to Petcraft Industries Incorporated, Melville, N.Y.
Filed Apr. 13, 1970, Ser. No. 27,720
Int. Cl. A01k *5/00, 7/00*
U.S. Cl. 119—61 **6 Claims**



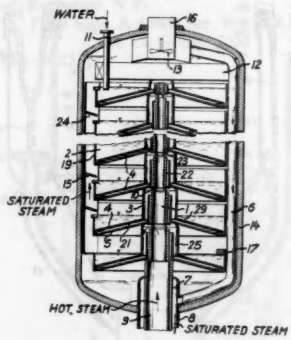
A bowl for pet food or the like having an outer wall forming a truncated conical surface and a floor portion integral with the outer wall which is sloped downwardly toward the deep end of the outer wall. A reinforcing web and a handle integral therewith may be provided on the outer wall together with a thumb notch in the deep portion of the outer wall above the handle.

3,611,999
ANIMAL DRINKING DEVICES
John Sutcliffe Hey, Horley, England, assignor to Farm Automation Limited, Horley, England
Filed Sept. 25, 1969, Ser. No. 861,034
Claims priority, application Great Britain, Sept. 25, 1968, 45498
Int. Cl. A01k *07/00*
U.S. Cl. 119—72.5 **2 Claims**



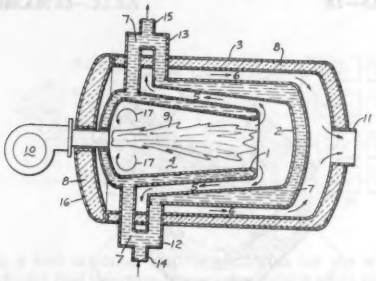
An animal drinking device comprising a valve arrangement operated by tilting a valve stem in a housing to release liquid. The housing is asymmetrically formed about a bore accommodating the stem to expose a part of the stem and allow the stem to be tilted by an animal biting the exposed part against an underlying wall of the housing.

3,612,000
SATURATED-STEAM GENERATOR
Karl-Heinrich Lochmann, Frankfurt-Niederrad, and Gerhard Dinges, Gelnhausen, both of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Germany
Filed Mar. 20, 1968, Ser. No. 714,711
Claims priority, application Germany, Mar. 27, 1967, L 56075 Ia/13g
Int. Cl. F22b *1/14*
U.S. Cl. 122—31 **12 Claims**



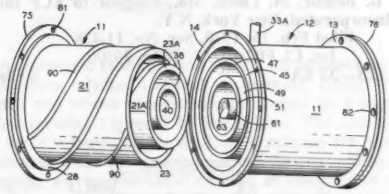
A saturated-steam generator of the Loffler type having a plurality of evaporator cups or levels disposed in series within a boiler vessel and an inlet pipe extending centrally through the evaporator cups. The inlet pipe includes a separate opening for each evaporator cup. A conduit leads from each inlet pipe opening to a chamber in the bottom of the associated evaporator cup. Perforations are provided in the bottom of the evaporator cup. Hot steam is delivered from the inlet pipe to the chamber in the bottom of the evaporator cup. The hot steam then passes through the perforations into boiling water held by the evaporator cup for processing to a supersaturated state.

3,612,001
BOILER
Rene Gossalter, CH 6301, Zug Owl, Switzerland
Filed May 27, 1969, Ser. No. 828,404
Int. Cl. F22b 7/00
U.S. Cl. 122—136 R 11 Claims



A boiler adapted to be fired by oil or gas for heating liquid, which comprises three double-walled bell-shaped hollow bodies of different diameters arranged in radially and axially spaced relationship to each other and extending one within the other so as to form interconnecting passage means therebetween, the open end of the smallest diameter hollow body being adjacent to the bottom of the adjacent larger hollow body and the bottom of the latter being adjacent to the bottom of the next outer hollow body so that said passage means has a meandering course, the inner wall of the smallest diameter double-walled hollow body defining a combustion chamber communicating with said passage means.

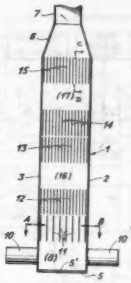
3,612,002
LIQUID-HEATING APPARATUS
Thomas Margittai, 778 Cornwall Drive, State College, Pa.
Filed Nov. 14, 1969, Ser. No. 876,706
Int. Cl. F22b 37/12
U.S. Cl. 122—208 7 Claims



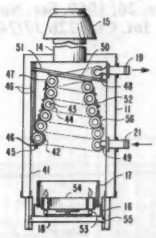
Heating apparatus for liquids which are exceedingly sensitive to even minute amounts of contaminants; such as foods, drugs, chemicals, cosmetics and the like; the apparatus being operable over a wide range of temperatures and pressures and lending itself to quick disassembly and reassembly to permit thorough cleaning of the several parts thereof.

3,612,003
FORCED THROUGH FLOW STEAM GENERATOR
Harendra Nath Sharan, Seuzach, Switzerland, assignor to Sulzer Borthers, Ltd., Winterthur, Switzerland
Filed June 25, 1969, Ser. No. 836,400
Claims priority, application Switzerland, June 26, 1968, 9522/68
Int. Cl. F22b 21/00
U.S. Cl. 122—235 R 14 Claims

The walls of the steam generator are formed of tubes through which the working medium flows and which form at least a part of the preheater surfaces. The flue gas is produced in a turbulence combustion chamber outside the steam generator and fed into a chamber at the bottom. The evaporator, superheater and other such surfaces are formed as tube platens disposed in parallel to the longer walls of the steam generator.



3,612,004
WATER HEATER
Edward Cancilla, Los Angeles, and Bernard E. McClanahan, La Habra, both of Calif., assignors to Ace Tank and Heater Company
Filed Nov. 24, 1969, Ser. No. 879,153
Int. Cl. F22b 21/26
U.S. Cl. 122—250 R 9 Claims

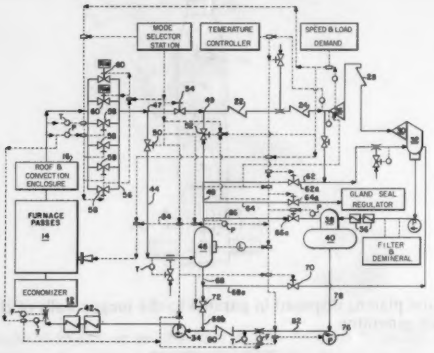


A water heater in which water is circulated through a coil wound in the form of a truncated cone with a base turn thereof of maximum diameter disposed adjacent the inner wall of the heater housing and the remaining turns thereof having diminishing diameters proceeding from the base turn to the top of the coil. By supporting the base turn of the coil, the remaining turns of the coil are substantially self-supporting and can undergo considerable expansion and contraction in response to temperature changes within the heater. The coil generally conforms to the shape of the flame generated by a burner located below the coil and provides for a relatively high rate of heat transfer to the circulating water when equipped with a baffle. The coil baffle may comprise a striplike element wound about and mounted on the outside of the coil so as to extend between adjacent coil turns.

3,612,005
ONCE-THROUGH STEAM GENERATOR RECIRCULATING STARTUP SYSTEM
Robert I. Lytle, Livingston, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.
Filed Jan. 12, 1970, Ser. No. 2,213
Int. Cl. F22b 29/06
U.S. Cl. 122—406 S 13 Claims

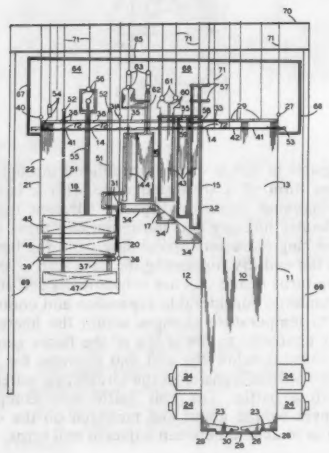
A once-through vapor generator including a startup bypass in which the flow in the bypass is at a reduced pressure. In the bypass, the flow is separated into vapor and liquid streams, the liquid stream being recirculated directly to the suction side of the generator main feed pump. A booster feed pump is provided upstream of the main feed pump and in se-

ries therewith. The booster feed pump is operative during startup to provide to the suction side of the main feed pump



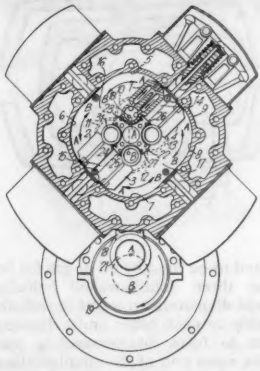
that makeup flow in addition to the recirculated flow necessary to prevent tube burnout in the generator.

3,612,006
EXPANSION SEAL
Michael C. Santucci, Barberton, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.
Filed Nov. 26, 1969, Ser. No. 880,268
Int. Cl. F22b *37/24*
U.S. Cl. 122—494 **5 Claims**



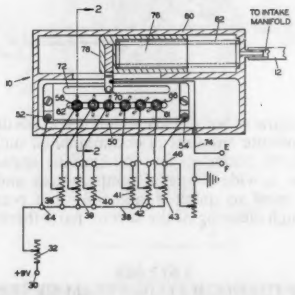
A gastight covering for the roof of a steam generator gas pass enclosure allowing for the passage of fluid-heating tubes terminating at a fixed point of support in an upper adjacent compartment. The covering is seal-welded to the adjoining wall structure and includes deflectable raised portions having perforated sections to admit the penetrating tubes and having the perforated edges seal-welded to the adjoining tube wall. Each raised portion is formed with side and corner sections arranged to readily deflect when subjected to the downward movement of the perforated section caused by the thermal growth of the portion of tube extending above the roof covering.

3,612,007
OSCILLATING PISTON INTERNAL COMBUSTION ENGINE OR COMPRESSOR
Robert Nicolas Balve, Remich 9, rue St. Nicolas, Grand Duchy, Luxembourg
Filed Nov. 24, 1969, Ser. No. 879,292
Claims priority, application Germany, Dec. 6, 1968, 57.486
Int. Cl. F02b *53/00;* **F04c** *21/00*
U.S. Cl. 123—18 **8 Claims**



An oscillating piston internal combustion engine or compressor in which at least two oscillating pistons are arranged in a work housing and coupled over gears to reciprocate relative to each other. The work chambers for the corresponding work phases are formed between the oscillating pistons. Self-lubricating hard carbon sealing strips are provided between the radial outer edges of the pistons and the internal surface of the work housing, and the pistons are cooled internally by a continuous stream of cooling fluid.

3,612,008
VACUUM-RESPONSIVE VOLTAGE GENERATOR FOR A FUEL INJECTION SYSTEM
Richard B. Beishir, St. Louis, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.
Filed Feb. 16, 1970, Ser. No. 11,428
Int. Cl. F02n *5/12;* **F02m** *39/00*
U.S. Cl. 123—32 EA **5 Claims**

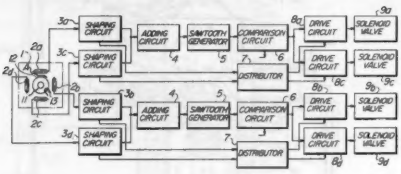


An arrangement for generating an irregularly varying voltage for an automobile fuel injection system includes a potentiometer having a plurality of voltage input taps connected to taps on a voltage divider, and an output tap movable along the potentiometer by a vacuum motor which responds to the pressure in the intake manifold of the automobile engine. The voltage input taps are elongated and are adjustable longitudinally and angularly to provide the required voltage distribution on the potentiometer.

3,612,009
FUEL INJECTION SYNCHRONIZING SYSTEM

Iseji Kamazuka, Kariya-shi, and Kunio Endo, Anjo-shi, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan

Filed Aug. 19, 1969, Ser. No. 851,318
Claims priority, application Japan, Aug. 28, 1969, 61685
Int. Cl. F02m *51/00*
U.S. Cl. 123—32 EA **6 Claims**

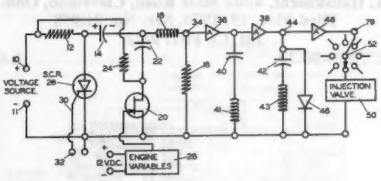


In a fuel injection control apparatus for use with a multicylinder fuel injection-type engine, which gives each fuel injection nozzle-operating solenoid valve an exciting pulse of a duration to satisfy the engine requirement, a fuel injection synchronizing system by which a pulse signal synchronous with the cycle of the engine is produced and the exciting pulse is distributed to each cylinder.

3,612,010
ELECTRONIC FUEL INJECTION CONTROL CIRCUIT

Richard Bert Beishir, St. Louis, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Sept. 19, 1969, Ser. No. 859,332
Int. Cl. F02m *51/00*
U.S. Cl. 123—32 EA **6 Claims**



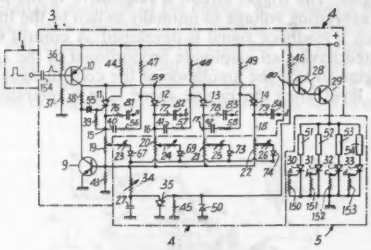
An electronic fuel injection system for automobile internal combustion engines includes a resonant circuit which is formed and whose capacitance is charged by a silicon-controlled rectifier triggered by the engine. The resulting half-sine wave voltages across the load resistance are of constant duration and are changed from a half-sine waveform to more triangular waves. Transistor circuits, at least one of which is biased by a voltage representing a number of engine operating conditions, convert the triangular waves into square wave voltages having a constant amplitude and a duration corresponding to the engine operating conditions. The resulting square waves or pulses are applied to solenoid injector valves to open them synchronously with the engine for required periods of time to supply the needed amounts of fuel.

3,612,011
ELECTRONIC DISTRIBUTOR OF ELECTRIC SIGNALS CONTROLLING THE OPERATION OF INTERNAL COMBUSTION ENGINE

Louis A. Monpetit, L'Etang-la-Ville, France, assignor to Societe des Procedes Modernes d'Injection SOPROMI, Les Mureaux, France

Filed Nov. 10, 1969, Ser. No. 875,185
Claims priority, application France, Dec. 20, 1968, 179,459
Int. Cl. F02m *51/00*; **F02b** *3/06*
U.S. Cl. 123—32 EA **16 Claims**

An electronic distributor of electric signals adapted to start operation of the spark plugs or injectors of an internal combustion engine in the desired sequence and if required, for a predetermined lapse of time. This is obtained by means of a static ring counter including as many semiconductor elements as there are tracks leading to the different cylinders. The operation of the engine produces signals in accordance with the speed of rotation so as to enable a main transistor to

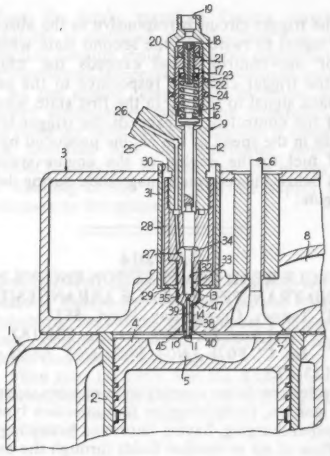


energize the cathodes of said semiconductor elements in sequence and to operate the corresponding sparking plugs or injectors at the desired sequence. Means are provided to constrain the cycle of energization of the counter components to always start with a predetermined component.

3,612,012
FUEL INJECTION NOZZLE

Alexander Dreisin, Olympia Fields, Ill., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 4, 1969, Ser. No. 882,120
Int. Cl. F02m *61/14*
U.S. Cl. 123—32 **10 Claims**



A fuel injection nozzle having a long narrow passage between the differential valve and the discharge orifices with narrow walls surrounding the passage to form a long narrow tip of small cross sectional area. The opening in the cylinder deck facing the combustion chamber receiving the tip is correspondingly small to decrease heat transfer from the combustion chamber to the needle valve.

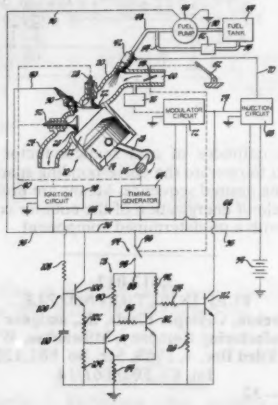
3,612,013
FUEL SUPPLY CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Charles C. Gambill, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1969, Ser. No. 879,122
Int. Cl. F02m *51/00*
U.S. Cl. 123—32 EA **2 Claims**

A fuel supply control system for an internal combustion engine includes a trigger circuit which is switchable between

first and second states. The application of fuel to the engine is permitted when the trigger circuit is in the first state and is prohibited when the trigger circuit is in the second state. An energizing voltage is produced in response to deceleration of the engine. The trigger circuit is responsive to the presence of the energizing voltage to normally switch to the first state in which a feedback signal is developed. A control signal is generated having an amplitude proportional to the speed of the engine so that the amplitude of the control signal is at a trigger level when the engine speed is at a reference mag-



nitude. The trigger circuit is responsive to the absence of the feedback signal to switch to the second state when the amplitude of the control signal exceeds the trigger level. Further, the trigger circuit is responsive to the presence of the feedback signal to remain in the first state when the amplitude of the control signal exceeds the trigger level due to an increase in the speed of the engine produced by the application of fuel to the engine as the engine speed initially decreases below the reference magnitude during deceleration of the engine.

3,612,014

TWO CYCLE REAR COMPRESSION ENGINE PORTING AND TRANSFER PASSAGE ARRANGEMENT

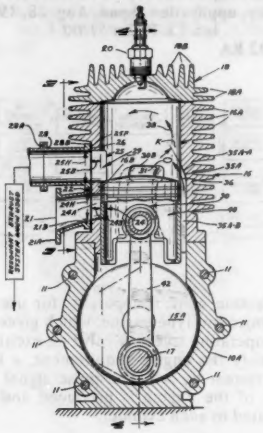
William L. Tenney, Crystal Bay, Minn., 55323

Filed Aug. 22, 1969, Ser. No. 852,182

Int. Cl. F02b *33/04*; **F02n** *3/08*, *17/02*

U.S. Cl. 123—73 **13 Claims**

Two-cycle, crankcase compression engines, spark or compression ignition, carburetion or fuel injection types, with or without supercharging, having improved balancing of restrictions to flow of air or air-fuel fluids through the engine; having at least one crankcase inlet port(s) location in the cylinder wall on the same side of the cylinder as the exhaust port(s) and below the level of the exhaust ports, having a plurality of transfer ports, at least some of which are located on the opposite side of the cylinder with the flow therefrom directed toward the cylinder head plus other transfer port(s) located and shaped so as to direct flow in a plane more nearly at right angles to the cylinder axis and thence merging with flow from the oppositely located transfer port(s), along the cylinder wall in a direction away from the exhaust port(s); the height of the exhaust port(s) for optimum operational characteristics being more than approximately 35 percent of stroke; in a modified form, in addition to the inlet below the exhaust port, including another subsidiary inlet(s) into the crankcase located below the oppositely situated transfer port(s); in engine propelled vehicles such as snowmobiles, where operator position is such that the engine is between the legs and near his crotch, the improvement of having inlet (carburetor) and exhaust on the same side of engine and locating such slide away from crotch of operator, the side of the engine towards the operator being devoid of hot or vaporous engine protuberances. Improvements that, in some forms, the engine is combined with a resonant exhaust system; improvements in attachment of inlet and exhaust manifolds are provided to minimize and/or regulate heat



transfer between exhaust manifold, cylinder and intake manifold, to minimize backflow of heat from the exhaust manifold to the cylinder and inlet manifold and to regulate temperature of various engine parts.

3,612,015

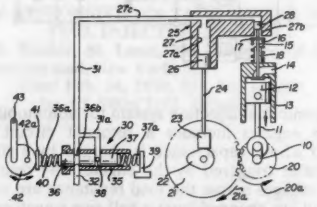
HYDRAULIC VALVE CONTROL SYSTEM

Louis A. Hausknecht, 4504 State Road, Cleveland, Ohio

Filed Mar. 19, 1970, Ser. No. 21,098

Int. Cl. F01l *9/02*

U.S. Cl. 123—90.12 **6 Claims**



A variable control mechanism for regulating the length of time and amount of opening of an engine valve during each cycle of operation. The control mechanism includes a closed hydraulic circuit or system including a reciprocal slave cylinder, a reciprocal master cylinder, and control means, which control the allocation of fluid volume within the hydraulic circuit so as to regulate the movement of the slave cylinders. The control means are adjustable so that the amount of regulation can likewise be adjusted.

3,612,016

VALVE SPRING RETAINER

William J. Jelen, 24634 Water St., Olmsted Falls, Ohio

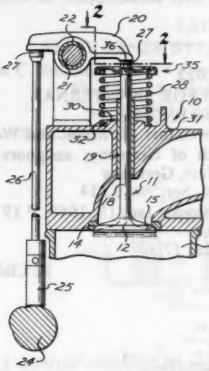
Filed July 13, 1970, Ser. No. 54,107

Int. Cl. F01l *3/10*

U.S. Cl. 123—90.67 **7 Claims**

A formed valve spring retainer means is provided which includes an annular ring extending inwardly into a plurality of formed resilient locking means particularly adapted to securely engage an annular groove located proximate to the distal end of a valve stem. The outward portion of the annular ring extends into a downwardly disposed dependent

flange portion whereby the under surfaces of the retainer means is particularly adapted to maintain a valve spring in

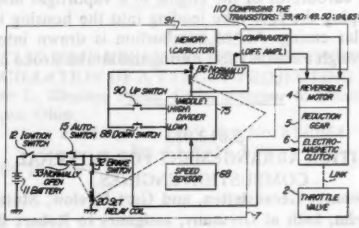


compression and concentric about the valve stem during the operative cycle of an internal combustion engine.

3,612,017
SYSTEM FOR AUTOMATICALLY CONTROLLING VEHICLE SPEED

Masayuki Ishizaki; Koichi Kawatake; Ryoji Kasama, and Masaki Kawai, all of Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1969, Ser. No. 810,201
Claims priority, application Japan, Apr. 10, 1968, 23348/68
Int. Cl. F02d *11/10*
U.S. Cl. 123—102 **12 Claims**



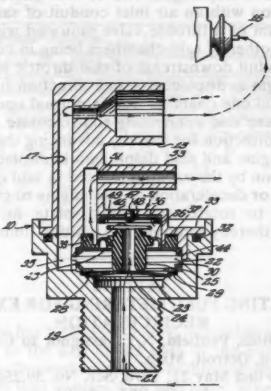
A system for automatically controlling vehicle speed, which is operative in such a manner that a voltage generated by a generator adapted to generate a voltage in proportion to the speed of an automotive vehicle is constantly impressed on the gate electrode of a field-effect transistor and also on the gate electrode of another field-effect transistor and a memory condenser through a normally closed switch, said two field-effect transistors and the respective load resistances forming a bridge circuit, and when automatic control is desired, the potential difference across the potential-detecting terminals of said bridge circuit and its deformation polarity are detected, with said normally closed switch open, whereby an electric motor is controlled for adjusting the degree of opening of the throttle valve of a carburetor.

3,612,018
THERMOSTATICALLY MODULATED VACUUM CONTROL VALVE

George A. Soberski, Des Plaines, Ill., assignor to Eaton Yale & Towne, Inc., Cleveland, Ohio

Filed Nov. 10, 1969, Ser. No. 875,425
Int. Cl. F02p *5/04*; **F16k** *17/38*
U.S. Cl. 123—117 A **10 Claims**

Thermostatically modulated vacuum control valve for controlling the distributor vacuum motor advancing the spark of an internal combustion engine. The valve housing has a vacuum input leading from the housing and a vacuum output leading into the housing and having communication with the vacuum input. The vacuum input is connected with a source of vacuum such as the carburetor of an internal combustion engine. The housing has a second vacuum input connected with the intake manifold of the engine. A diaphragm valve is sealed to a valve chamber in the housing and is seated on a bimetal disk extending across the chamber and having a central opening leading therethrough. The diaphragm valve is biased into engagement with the seat by a spring and is moved out of engagement with the seat by vacuum to control

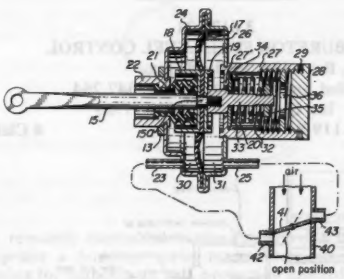


vacuum from the intake manifold. During normal driving speeds, vacuum is obtained directly from the carburetor through the first vacuum input. When the engine is idling and is below a preselected temperature, the vacuum control valve is closed. As the engine temperature increases above this predetermined temperature range, the bimetallic seat will move away from the valve and a connection is made between the intake manifold and the distributor motor. Upon deceleration of the engine, vacuum from the intake manifold will effect opening of the valve and the supply of intake manifold vacuum to the motor.

3,612,019
VACUUM-CONTROLLED SPARK-TIMING DEVICE

Hisaji Okamoto, Kariya-shi; Yosiaki Takeda, Nagoya, and Yosio Hukuhara, Yokohama, all of Japan, assignors to Nippon Denso Company Limited, Kariya-shi, Japan and Kyosandenki Co., Ltd., Tokyo, Japan

Filed June 11, 1969, Ser. No. 832,191
Claims priority, application Japan, Oct. 5, 1968, 43/72623
Int. Cl. F02p *5/10*
U.S. Cl. 123—117 A **4 Claims**



A vacuum-controlled spark-timing device for combined use with a contact breaker of a gasoline engine, said device having a rotatable plate mounted for free rotation about a

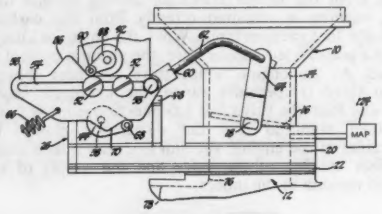
camshaft in a contact breaker housing, said rotatable plate having thereon a fixed contact point and a contact breaker lever pivotably mounted on said rotatable plate, said pivotable lever having thereon a cam follower in sliding contact with the cam surface of said camshaft and a movable contact point adapted to be brought into or out of electrically conductive contact with said fixed contact point upon rotation of said camshaft, a hermetically sealed casing mounted on said contact breaker housing and having a diaphragm dividing the interior of said casing into two chambers, a connecting rod sealingly extending through said casing and having one end pivotably connected to said rotatable plate and the other end secured to said diaphragm, one of said chambers being in communication with an air inlet conduit of said engine at a point upstream of a throttle valve mounted within said conduit and the other of said chambers being in communication with said conduit downstream of said throttle valve, whereby said diaphragm is displaced in one direction by the vacuum exerted to said one chamber during normal operation of said engine to cause said connecting rod to rotate said rotatable plate in one direction for thereby advancing the ignition timing of the engine and said diaphragm is displaced in the opposite direction by the vacuum exerted to said other chamber during idling or deceleration of said engine to cause said connecting rod to rotate said rotary plate in the opposite direction for thereby retarding the ignition timing.

3,612,020

COMPENSATING FUEL METERING FOR EXHAUST GAS RECIRCULATION

John W. Moulds, Penfield, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed May 21, 1970, Ser. No. 39,258
Int. Cl. F02m *25/06*
U.S. Cl. 123—119 A 1 Claim



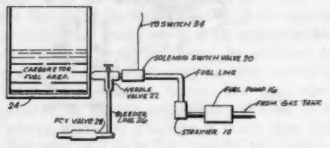
In an internal combustion engine, exhaust gas is recirculated from the intake manifold exhaust gas crossover passage to the induction passage. An exhaust gas recirculation control valve is positioned by the throttle to proportion exhaust gas recirculation flow to induction airflow. In one embodiment, the exhaust gas recirculation passages are cast integrally in the intake manifold. Fuel metering in a timed fuel injection system responsive to manifold absolute pressure is compensated for exhaust gas recirculation.

3,612,021

CARBURETOR FUEL LEVEL CONTROL

Ralph R. Ross, Box 4554, Midland, Tex.

Filed Aug. 4, 1969, Ser. No. 847,264
Int. Cl. F02f *9/00*; F02b *77/00*
U.S. Cl. 123—119 B 4 Claims



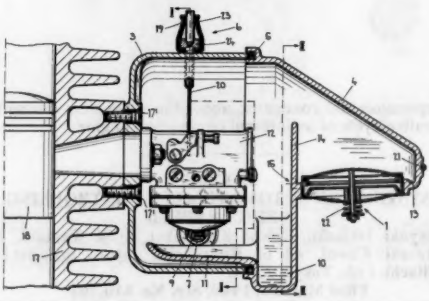
A carburetor for an internal combustion engine for a vehicle such as an automobile is provided with a mechanism for preventing the fuel level in the carburetor from getting too high or too low thereby preventing flooding, hard starting and reduction of efficiency of fuel consumption as well as keeping PCV valve cleaner.

3,612,022

FUEL SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Franz-Josef Von Bomhard, Schweinfurt am Main, and Wolfgang Baier, Gochsheim, both of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Jan. 13, 1970, Ser. No. 2,514
Claims priority, application Germany, Jan. 18, 1969, P 19 02 440.9
Int. Cl. F02m *17/30*
U.S. Cl. 123—136 12 Claims



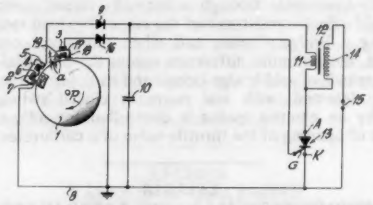
Fires in the fuel supply system for an internal combustion engine operating in a confined space are prevented by enclosing the carburetor of the engine in a vaportight housing and enveloping the fuel tube leading into the housing in an outer tubular casing. Air of combustion is drawn into the housing through a check valve during the intake stroke of the engine.

3,612,023

IGNITION ARRANGEMENT FOR INTERNAL COMBUSTION ENGINES

Gerhard Sohner, Geradstetten, and Gert Strelow, Stuttgart-Stammheim, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed July 2, 1969, Ser. No. 838,423
Claims priority, application Germany, July 4, 1968, P 17 64 609.2
Int. Cl. F02p *3/06*
U.S. Cl. 123—149 A 16 Claims



An ignition arrangement for internal combustion engines in which an induced voltage charges an ignition capacitor. A magnetic member driven by the engine induces the charging voltage within a charging coil and, moreover, induces a control voltage within another coil for controlling an electronic switch. When the latter is turned on, the capacitor discharges through the primary winding of an ignition transformer to

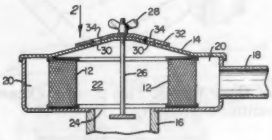
generate a voltage for firing the spark plugs. Ignition of the fuel-air mixture is inhibited when the engine is rotating in the wrong direction.

3,612,024

AIR CLEANER BYPASS ARRANGEMENT

John C. Bandimere, 3740 Fenton St., Wheatridge, Colo.

Filed Nov. 3, 1969, Ser. No. 873,167
Int. Cl. B01d *46/42*; F02m *17/34*
U.S. Cl. 123—198 E 3 Claims



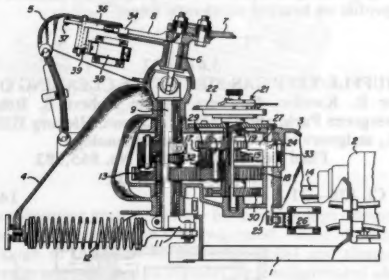
An internal combustion engine air cleaner, of particular utility for use with vehicle engines, characterized by a bypass valve which permits unfiltered air to enter the carburetor of an otto-type engine, or the intake manifold of a diesel or other solid injection engine, without passing through the filter element of the air cleaner. By comparative road mileage tests, with the valve open or closed, the operator may determine the need for cleaning or replacement of the air filter element. For top or full throttle performance, such as in racing, the operator may eliminate the airflow restriction through the filter element, with the valve open, and permit unfiltered air to enter the engine, thereby delivering a greater rate of flow to same. A further feature resides in the automatic closing of the bypass valve in the event of a backfire in the engine intake manifold to thereby confine the backfire flame to the interior of the air cleaner.

3,612,025

CYCLIC TIME DELAY SYSTEM FOR INTERRUPTING OSCILLATION OF A TARGET-PROJECTING DEVICE

Walter L. Rhodes, Piqua, Ohio, assignor to Rhodeside, Inc., Piqua, Ohio

Filed Apr. 7, 1969, Ser. No. 814,044
Int. Cl. F41b *3/04*
U.S. Cl. 124—9 15 Claims



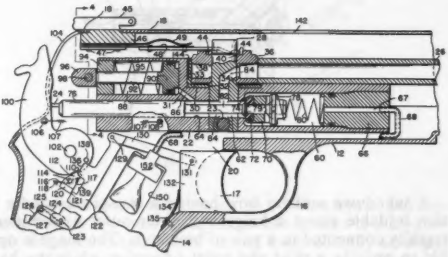
A variably functioning interrupter mechanism applied to a clay-target-launching or like device. It provides a motorized cam and switch assembly which defines an attachment unit integrated to exert an overriding influence on the launching system controls. Adapted to a target-launching device, the cam may be constructed to effect switch operation in intervals of nonuniform frequency and duration to interrupt oscillation of a throwing arm support in a way to obviate reading or anticipating the angle of flight of a released target.

3,612,026

GAS-OPERATED REVOLVER WITH ROTATABLE MAGAZINE

John F. Vadas, Webster, and Sigurds Liepins, Rushville, both of N.Y., assignors to Crosman Arms Company, Inc., Fairport, N.Y.

Division of Ser. No. 697,049, Jan. 11, 1968, Pat. No. 3,549,095.
Filed Mar. 18, 1970, Ser. No. 20,500
Int. Cl. F41b *11/00*
U.S. Cl. 124—11 11 Claims



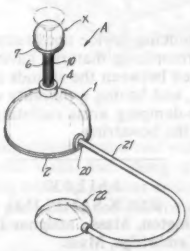
This revolver has a revolver barrel indexable about an axis perpendicular to the axis of the bore of the gun barrel, and having radially disposed, projectile-holding chambers indexable successively into registry with said bore. When the trigger is squeezed, the hammer opens a valve, to deliver gas under pressure behind the projectile, which, at the time, is in registry with said bore, to propel said projectile from the gun. Opening of the valve also supplies gas to a piston to retract a reciprocable indexing mechanism on the frame. This mechanism recocks the hammer and permits the valve to close. A spring returns the mechanism to battery. On this return movement, a pawl carried by the mechanism indexes the revolver barrel.

3,612,027

REMOTELY CONTROLLED SPRING-TYPE BALL PROJECTING DEVICE

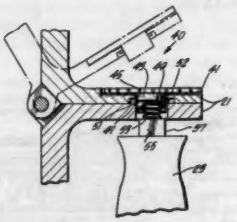
Ginji Makino, Higashi Shinkoiwa, Katsushika-Ku, Tokyo, Japan

Filed Feb. 4, 1970, Ser. No. 8,550
Int. Cl. F41b *7/00*
U.S. Cl. 124—16 8 Claims



A remotely controlled device for practice batting, which comprises a housing, spring-loaded vertically displaceable member for launching a ball, projecting upwardly through an opening of the housing, and means for releasably locking the ball-launching means, provided within said housing and controlled by a remotely situated remote-control device. It can serve not only for improvement of batting technique, but also for physical training and amusement.

3,612,028
A TAKEDOWN TWO-PIECE HINGEDLY CONNECTED ARCHERY BOW
Richard S. Karbo, Whittier, Calif., assignor to The Leisure Group, Inc., Los Angeles, Calif.
Filed Mar. 11, 1970, Ser. No. 18,514
Int. Cl. F41b *5/00*
U.S. Cl. 124—24 7 Claims



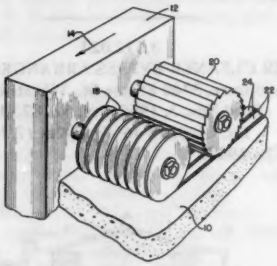
A takedown archery bow having a two-piece handle portion foldable about a hinge with their outer extremities integrally connected to a pair of bow ends. The hinge is operable to provide a rigid and quiet operation while the handle portion is secured in the operable position by a locking assembly that at all times is integral with the bow structure. In the operable position, the bow handles are further characterized in that they are offset transversely from the common plane to provide an unobstructed view of the target area.

3,612,029
BOWSTRING-SILENCING DEVICE
Cornelius F. Carroll, 1310 Tuxedo Ave., Parma, Ohio; Lloyd E. Abernathy, 10922 Killdare Court, St. Anns, Mo., and Allen W. Miller, 10801 Ridgecrest Drive, St. Anns, Mo.
Filed Jan. 8, 1970, Ser. No. 1,400
Int. Cl. F41b *5/00*
U.S. Cl. 124—30 A 3 Claims

A bowstring-silencing device constructed of a tough, flexible synthetic thermoplastic material having a central core inserted and retained between the strands of a twisted multiple strand bowstring, and having a plurality of flexible integrally formed vibration-damping arms radiating from the core on opposite sides of the bowstring.

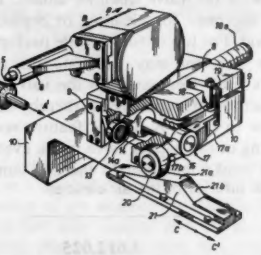
3,612,030
ROCK SAMPLING
Philip Blum, Lexington, Mass., assignor to National Research Corporation, Cambridge, Mass.
Continuation-in-part of application Ser. No. 611,414, Jan. 24, 1967, now abandoned. This application Sept. 11, 1969, Ser. No. 857,241
Int. Cl. B28d *1/00*
U.S. Cl. 125—1 10 Claims

A method for sampling rock and other brittle materials and for controlling resultant particle sizes is described. The method involves cutting grooves in the rock surface to provide a grouping of parallel ridges and subsequently machining the ridges to provide a powder specimen. The machining step may comprise milling, drilling, lathe cutting or the like; but a planing step is advantageous. Control of the particle size distribution is effected primarily by changing the height



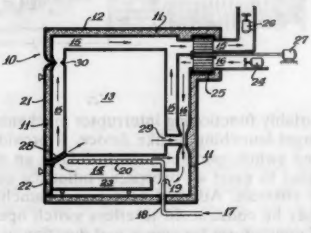
and width of these ridges. This control exceeds that obtainable by conventional grinding.

3,612,031
GRINDING WHEEL DRESSER
Gian Luigi Mazzarelli, Turin, Italy, assignor to S.p.A. Cimat, Turin, Italy
Filed June 28, 1968, Ser. No. 741,130
Claims priority, application Italy, Mar. 15, 1968, 807879
Int. Cl. B24b *53/00*
U.S. Cl. 125—11 7 Claims



This invention relates to a machine tool for dressing a grinding wheel with a concave profile. The wheel is rotated and is reciprocated axially, and a cutting tool is moved radially relative thereto under control of an eccentric cam. The eccentric cam is rocked under control of the relative movement of the grinding wheel and the tool support by means of a linear inclined cam, which is preferably of adjustable inclination, to control the depth of the concave profile. The dressed grinding wheel may be used in an automatically cycling grinding machine for forming track surfaces of convex profile on bearing outer race rings.

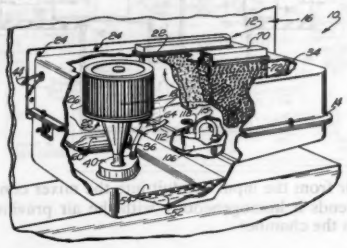
3,612,032
MUFFLE-TYPE GAS-FIRED SELF-CLEANING OVEN
Esher R. Kweller, Downers Grove; Robert B. Rosenberg, Evergreen Park, and Dennis H. Larson, Hickory Hills, all of Ill., assignors to Institute of Gas Technology
Filed Oct. 10, 1969, Ser. No. 865,282
Int. Cl. F24c *15/32*
U.S. Cl. 126—21 A 14 Claims



A self-cleaning gas oven having separated cooking and heating compartments in which the smoke and odor-contain-

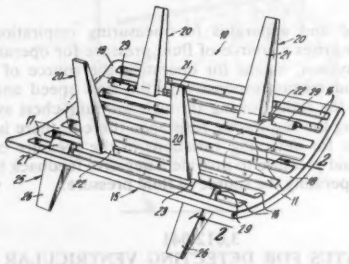
ing gases from the cooking compartment are mixed with the air required for the combustion of fuel and passed into the heating compartment so that smoke and odor components are incinerated by the combustion process.

3,612,033
FURNACE HUMIDIFIER
Kermit E. Chilcoat, North Olmsted, Ohio, assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Sept. 17, 1969, Ser. No. 858,795
Int. Cl. F24f *3/14*
U.S. Cl. 126—113 **16 Claims**



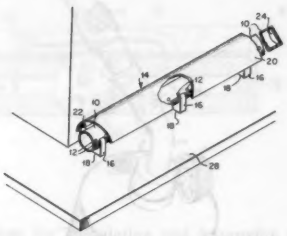
A humidifier includes a housing in which vaporizer means for promoting vaporization of liquid is removably received. The vaporizer means includes a liquid manifold and a porous material. The liquid manifold is connected to a pump assembly by a conduit such that the manifold is supplied with a liquid thereby. The manifold has a portion which grips the porous material such that the porosity of the material is controlled and the flow of liquid from the manifold to the porous material is regulated thereby. The manifold is configured such that the vaporizer means and manifold are removable without disassembly of the humidifier.

3,612,034
GRATE ASSEMBLY WITH LOG-SUPPORTING ARRANGEMENT
Lyman P. Wood, Cedar Beach, Charlotte, Vt., and Douglas Merrilees, Vine St., Northfield, Vt.
Filed Apr. 17, 1970, Ser. No. 29,499
Int. Cl. F23h *13/02*
U.S. Cl. 126—165 **11 Claims**



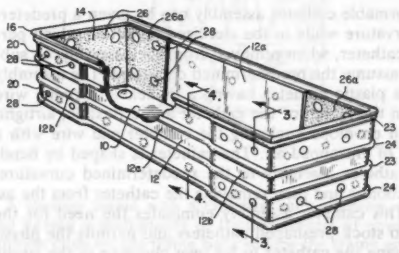
A wood-burning grate assembly for burning logs comprises a metal log-supporting shelf formed with apertures therethrough in the form of spaced, parallel and elongated slots. Means are provided to support the shelf elevated above a support base. Relatively elongated metal prongs are insertable into selected apertures to extend above the shelf to retain logs on the shelf in a selected pattern. Each prong has, at one end, a laterally reduced extension forming a shoulder engageable with one surface of the shelf and having a hook portion at its free end engageable with the other surface of the shelf, when the extension is inserted, with clearance, into an aperture. The prongs may also be used as the support means for the shelf, and either may be solid or may be apertured, to reduce weight. Each prong may have either one such shoulder or may have a pair of oppositely extending shoulders.

3,612,035
SYSTEM FOR CLEARING SNOW AND ICE FROM A SURFACE
Albert Kronen, 147 E. 82nd St., New York, N.Y.
Filed Jan. 29, 1970, Ser. No. 6,692
Int. Cl. E01h *5/10*
U.S. Cl. 126—271.1 **6 Claims**



A snow- and ice-clearing system in which a snow- and ice-melting fluid is fed under pressure from a source to a longitudinally disposed tubular body having longitudinally arranged spray openings in its wall; such body resting on spaced supports disposable on the surface to be cleared; the supports interconnected into a unit by a transversely arcuate deflector plate connected by one edge to the supports and overhanging them and arranged to deflect discharged fluid from the tube openings against the surface. The fluid may be hot water or steam and the source a building-heating boiler.

3,612,036
INSULATED BAKE PAN
Morris Kaufman, Morton Grove, Ill., assignor to Ekco Products, Inc., Wheeling, Ill.
Filed May 6, 1970, Ser. No. 35,094
Int. Cl. A47j *36/02*
U.S. Cl. 126—390 **16 Claims**

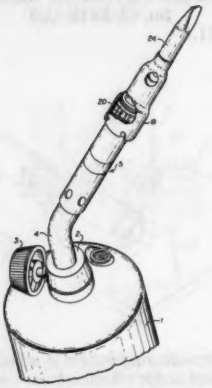


A baking pan having sidewalls and end walls, has insulating inserts along the end walls and along a portion of the sidewalls near the end walls to prevent concentration of heat near the ends of the pan and to provide for slow and uniform heating of the product.

3,612,037
BLOWTORCH BURNER ATTACHMENT QUICK CONNECT-DISCONNECT DEVICE
John B. Spiggle, Rochester, N.Y., assignor to Bernzomatic Corporation, Rochester, N.Y.
Filed Apr. 14, 1969, Ser. No. 815,758
Int. Cl. B23k *3/02*; **F23d** *13/04, 13/30*
U.S. Cl. 126—414 **4 Claims**

A blowtorch burner attachment which has a quick connect-disconnect device, the attachment formed as a ther-

moconcentrator which directs the flame into an area of the thermoconcentrator provided with a soldering tip or other

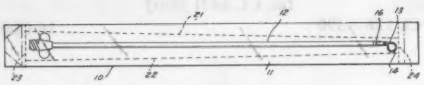


conductive means of transferring heat, or formed to provide flame shapes for special applications.

3,612,038
PREFORMABLE CATHETER PACKAGE ASSEMBLY AND METHOD OF PREFORMING

James C. Halligan, Fair Lawn, N.J., assignor to Becton Dickinson and Company, East Rutherford, N.J.

Filed Feb. 3, 1969, Ser. No. 795,896
Int. Cl. A61b *5/02; A61m 25/00*
U.S. Cl. 128—2.05 R **11 Claims**



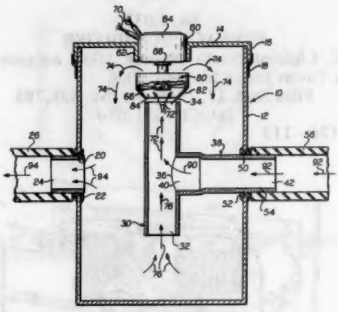
A preformable catheter assembly can be given a predetermined curvature while in the sterilized condition which permits the catheter, when removed from the assembly, to substantially assume the predetermined curvature. The assembly includes a plastic catheter having a malleable forming wire inserted in the lumen of the catheter and a flexible, airtight, waterproof envelope enclosing the catheter and wire with a minimum of entrapped air. The catheter is shaped by bending the catheter assembly to the predetermined curvature, heating, cooling and then removing the catheter from the assembly. This catheter assembly eliminates the need for the hospital to stock preshaped catheters and permits the physician to shape the catheter to his own choosing in the sterile condition prior to the operative procedure.

3,612,039
AIR HOMOGENIZER FOR RESPIRATORY GAS ANALYSIS EQUIPMENT

Donald B. Falk, East Seaford, N.Y., assignor to Instrumentation Associates Inc., New York, N.Y.

Filed Feb. 2, 1970, Ser. No. 7,804
Int. Cl. A61b *5/00*
U.S. Cl. 128—2.07 **6 Claims**

An air homogenizer device comprising an enclosure defining a chamber formed with an inlet opening and an outlet port, and a mixer conduit within the chamber forming the crossbar of a T-shaped pipe configuration. The other leg of the "T" is an input conduit connecting the center of the mixer conduit to the inlet opening of the chamber. The chamber has a removable lid formed with a central opening which receives a fan motor having a drive shaft depending therefrom. A fan blade on the shaft and a surrounding annular duct cooperate to draw air from an exit port formed in the mixer conduit, causing air within the chamber to be drawn into an entrance port. The resulting flow entrains and

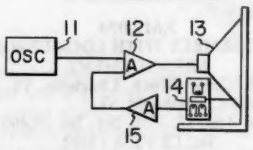


draws air from the input conduit into the mixer conduit, and there blends it homogeneously with the air previously contained in the chamber.

3,612,040
METHOD AND APPARATUS FOR MEASURING RESPIRATION RESISTANCE

Yoshihiko Sugiyama, Tokyo; Kaoru Imaoka, Tokyo, and Genzo Tanabe, Kobe, all of Japan, assignors to Nihon Kohden Kogyo, Ltd., Tokyo, Japan

Filed Mar. 12, 1969, Ser. No. 806,563
Claims priority, application Japan, Mar. 16, 1968, 43/17148
Int. Cl. A61b *5/08*
U.S. Cl. 128—2.08 **4 Claims**



A method and apparatus for measuring respiration resistance comprises a source of fluid pressure for operating a lung-chest system, means for operating the source of fluid pressure, and means responsive to the flow speed and the pressure of the fluid flowing through the lung-chest system for displaying the respiration resistance thereof, there is provided means for detecting variations in the pressure of the source of fluid pressure to provide a negative feedback to the means for operating the source of fluid pressure.

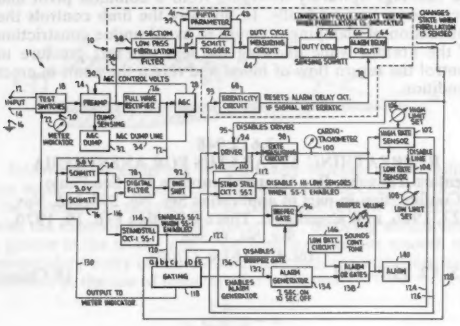
3,612,041
APPARATUS FOR DETECTING VENTRICULAR FIBRILLATION

Charles W. Ragsdale, Takoma Park, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed July 25, 1969, Ser. No. 844,996
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 A **1 Claim**

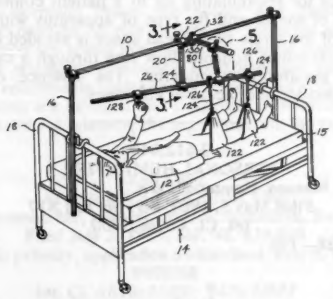
An electronic sensing scheme for the automatic detection and indication of ventricular fibrillation from the myocardial waveforms of a human heart. The circuitry is an improvement upon and is specifically designed to be incorporated into a lightweight, battery-operated heart monitor of a prior United States application cited herein. The additional circuitry provides increased reliability and sensitivity to the heart monitor for distinguishing ventricular fibrillation waveforms from closely related waveforms that formerly gave false indications of ventricular fibrillation. The latter

group of waveforms include those that exhibited pulse rates of less than 150 pulses per minute and/or were unipolar in nature while at the same time had large duty cycles. A



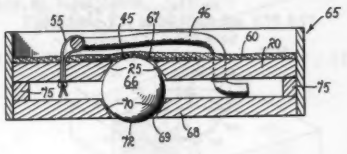
preferred embodiment of the new circuitry requires that at least two positive-going and two negative-going signals, exceeding +4.0-volt and −4.0-volt levels, respectively, and occurring at a 200 to 500 beats-per-minute rate, must be produced at least every 8 seconds in order for fibrillation to be indicated by the monitor.

3,612,042
HIP EXERCISER
Louis R. Fry, 4465 Forest S. E., Mercer Island, Wash.
Filed Jan. 13, 1970, Ser. No. 2,577
Int. Cl. A61h *1/02*
U.S. Cl. 128—25 R **12 Claims**



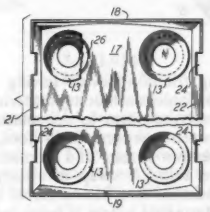
A hip exerciser usable by a bedridden patient which includes a rigid frame positionable adjacent the patient and an elongated, rigid member supported by said frame and having an intermediate part pivotally connected to the frame so as to be swingable about a substantially vertical axis. The elongated member is adapted to be positioned over the patient with the pivotal axis thereof generally intersecting the anatomical center of the femoral head of a selected leg of the patient. One end part of the elongated member carries means for supporting the leg of the patient and the opposite end part of the elongated member is positionable within arm's reach of the patient to enable the patient to grasp or otherwise engage the opposite end part of the elongated member to swing the member about its pivot connection and to cause shiftable movement of the supported leg.

3,612,043
HEALTH SHOE
Toyojiro Inaki, 58 E. Lincoln, Easton, Calif.
Filed Aug. 21, 1969, Ser. No. 851,940
Int. Cl. A61h *15/00*
U.S. Cl. 128—57 **1 Claim**



A health shoe for stimulating and improving nerve and muscle tone throughout the body of a wearer providing a frame adapted to be worn on the foot of a wearer while walking with the frame having a motion-generating, fast-stimulating member mounted thereon and a flowable, particulate material interposed the foot of the wearer and the stimulating member to transmit and to convert such motion of the stimulating member into a massaging force upon the sole portion of the foot of the wearer.

3,612,044
BACK MASSAGE AND SCRUB FIXTURE
Hector R. Gurrola, 280 Maiden Lane, Montebello, Calif.
Filed Mar. 24, 1969, Ser. No. 809,603
Int. Cl. A61h *7/00*
U.S. Cl. 128—62 R **3 Claims**

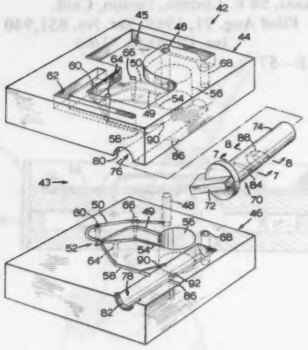


A shallow frame with a concave back supports a friction pad having a multiplicity of friction fingers of equal length. Suction cups on the frame back secure the frame and pad to a support surface such as a wall. Finger grips on the frame afford means for removing the cups from the wall to transfer the scrubber to another position or location. The friction fingers define a horizontally concave area adapted to fit the human back.

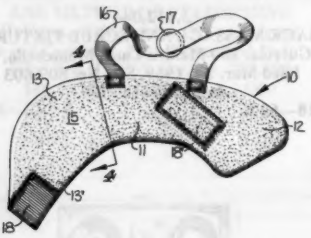
3,612,045
PULSATING DENTAL SYRINGE
Frank E. Dudas, Toronto, Ontario; Ingo Glende, Downsview, Ontario; Geza Kardos, Burlington, Ontario, and Edward V. Rippingille, Jr., Don Mills, Ontario, all of Canada, assignors to Dudas Juypers Rowan Limited, Toronto, Ontario, Canada, by said Frank E. Dudas, Ingo Glende and Geza Kardos
Filed Feb. 18, 1969, Ser. No. 800,071
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **2 Claims**

A hygenic dental syringe having a fluidic oscillator for producing pulsations of water for cleansing the mouth and massaging the gums. The device includes a reservoir for

mouthwash, and means for mixing the mouthwash with the main stream of water passing through the device.

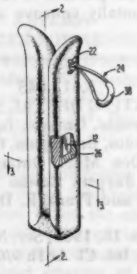


3,612,046
TRACTION DEVICE
John F. Gaylord, Jr., Matthews, N.C., assignor to Medical Specialties, Inc., Charlotte, N.C.
Filed Sept. 8, 1969, Ser. No. 856,080
Int. Cl. A61h *1/02*
U.S. Cl. 128—75 **5 Claims**



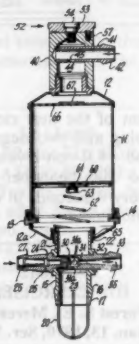
A foot-engaging traction device having a body member formed of air permeable, cushioning material and adapted to surround and closely conform to the anatomy of the ankle and heel and instep portions of a foot, while exerting minimum compressive forces and contacting a relatively large area of the skin. A strap is attached to the body member for connection to a conventional traction applying apparatus, and a fastening means is provided to easily secure the body member about the ankle.

3,612,047
PROSTHETIC GENITAL DEVICE
Francis C. Nesbit, 1112 Floyd St. N.E., Covington, Ga.
Filed Nov. 20, 1968, Ser. No. 777,320
Int. Cl. A61f *5/00*
U.S. Cl. 128—79 **9 Claims**



A clamping action for supplementing the sphincter muscle of the human penis is exerted by a clamping force covered with cushioning material and provided with a resilient band to exert the desired clamping pressure. The clamping frame comprises a pair of elongate legs, hingedly secured together. In one embodiment, one leg is provided with a lateral limb, the two legs being pivotally joined at the free end of the limb. In the other embodiment, the two legs are complementary, the two legs upwardly diverging from a common pivot and then converging gradually. In this way the limb controls the application of clamping pressure to avoid undue constriction of the urethra while allowing the legs to exert pressure to control the return flow of blood and retain the penis in erect condition.

3,612,048
REBREATHING APPARATUS FOR ANESTHESIA
Kentaro Takaoka, Rua Gaspar Laurenco 1-c, Sao Paulo
Continuation-in-part of application Ser. No. 596,266, Nov. 22, 1966, now abandoned. This application Feb. 19, 1970, Ser. No. 12,598
Int. Cl. A61m *17/00*
U.S. Cl. 128—188 **10 Claims**

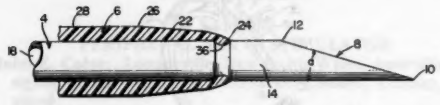


A device for recirculating air to a patient combining the simplicity of the to and fro type of apparatus with the advantages of the circle type. Dead space is avoided by use of two venturis which enhance flow rate through a canister of carbonic gas-absorbing material. The absence of valves lowers resistance and increases efficiency.

3,612,049
PERSONAL HUMIDIFIER
Veldon A. Monson, Hammond, Wis.
Filed May 5, 1969, Ser. No. 821,817
Int. Cl. A61m *15/00*
U.S. Cl. 128—195 **2 Claims**

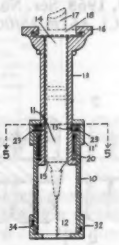
Apparatus for providing humans with a breathing zone of high humidity. The apparatus comprises a face mask, including an absorbent pad, and means for supplying water, with or without added medication, to the face mask.

3,612,050
INTRAVASCULAR CATHETERS
David S. Sheridan, Hook Road, Argyle, N.Y.
Filed Apr. 1, 1969, Ser. No. 812,102
Int. Cl. A61m 05/00
U.S. Cl. 128—214.4 1 Claim



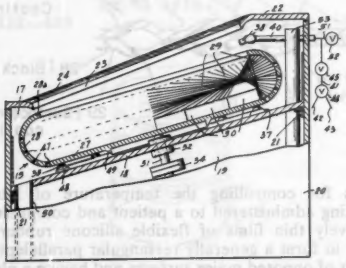
Intravascular catheters of improved vascular insertability are made with a plastic catheter snugly encircling a trocar. The catheter is tapered at the distal end which is blended with the exterior wall of the trocar, e.g., by being shrunk into a groove in the trocar wall. This structure permits smooth intravasculary entry of the catheter and reduces occurrence of phlebitis in the use of intravascular catheters.

3,612,051
HYPODERMIC SYRINGE APPLICATING DEVICE
Raul Olvera Arce, Cordobanes 25, Mexico City 19, Mexico
Filed July 24, 1968, Ser. No. 747,277
Int. Cl. A61m 05/00, 05/20
U.S. Cl. 128—215 1 Claim



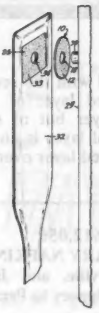
The applicator includes a hypodermic syringe holder telescopingly mounted for movement within a guide portion. A spring normally biases the holder and guide into a telescoped position. A pair of arcuate segments within the guide portion are spring biased into an annular groove in the holder for releasably positioning the holder and guide in an extended relationship under spring tension. Adjacent ends of the segments are bevelled and cooperate with bevelled ends of an actuator for releasing the segments from the groove.

3,612,052
APPARATUS FOR PEDICURE
Leo Krummenacher, Luzernerstrasse 36, Ebikon, Switzerland
Filed July 3, 1969, Ser. No. 839,029
Claims priority, application Switzerland, July 3, 1968, 9929/68
Int. Cl. A61m 35/00; A47k 3/022
U.S. Cl. 128—260 12 Claims



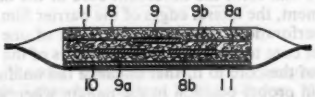
A rotary foot treatment brush is mounted within an open topped treatment chamber within which medicated fluid and rinse water are supplied to the brushing area, as well as drying air following liquid treatment, and means are provided for programming a treating cycle.

3,612,053
OSTOMY SEALING WASHER
Ronnie L. Pratt, Hammond Township, St. Croix County, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed June 23, 1969, Ser. No. 835,657
Int. Cl. A61f 5/44
U.S. Cl. 128—283 11 Claims



An ostomy-sealing washer is provided which is adapted to fit over an intestinal stoma for use with a postsurgical drainage pouch; it comprises a pliable, resiliently flexible elastoplastic sheet material body having a water-activatable adhesive on one surface which, after activation, becomes water insoluble. The ostomy-sealing washer has an aperture therethrough sufficient to receive the stoma and is adapted to be adhered to the human skin on that side having the adhesive and to an adherent drainage pouch on the other side forming a seal therebetween preventing leakage between the stoma and the pouch.

3,612,054
SANITARY NAPKIN
Tamio Matsuda; Tsutomu Okamura, Tokyo, and Nobu Konishi, Kanagawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co. Ltd., Tokyo, Japan
Filed July 24, 1969, Ser. No. 844,378
Claims priority, application Japan, July 31, 1968, June 19, 1969, 43/65328;44/57313
Int. Cl. A61f 13/16
U.S. Cl. 128—287 2 Claims

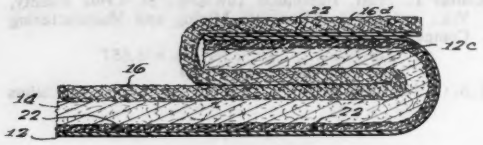


A sanitary napkin comprising a plurality of layers of absorbent material, at least one barrier sheet of liquid repellent material interposed between said absorbent layers, said sheet being completely liquid repellent, a waterproof strip, and an outer wrapper.

3,612,055
DISPOSABLE DIAPER OR THE LIKE AND METHOD OF MANUFACTURE
Frederick K. Mesek, Downers Grove, and Virginia L. Repke, Oak Forest, both of Ill., assignors to Johnson & Johnson
Continuation-in-part of application Ser. No. 861,689, Sept. 29, 1969. This application Jan. 29, 1970, Ser. No. 6,864
Int. Cl. A61f 13/16
U.S. Cl. 128—287 21 Claims

A disposable multilayer diaper of high absorptive capacity is provided which comprises as a first layer, to be brought

into contact with an infant's skin, a porous, fibrous, nonwoven bonded facing web of controlled wettability made of mixed long and short fibers. A second layer, in juxtaposition to the facing layer, is a highly porous, loosely compacted cellulosic batt having greater wettability than that of the facing

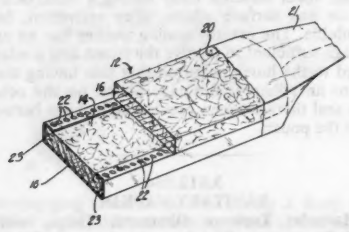


web. A third layer, integral with the second, is a paperlike, densified, highly compacted layer of the same cellulosic material as the second layer but of substantially smaller average pore size. The final layer is an impervious backing sheet adhered to the densified layer over a widely distributed area of adhesion.

3,612,056
SANITARY NAPKIN

Vladimir Marchuk, Somerville, and James A. Ginocchio, Summit, both of N.J., assignors to Personal Products Company

Filed Sept. 29, 1969, Ser. No. 861,651
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 **3 Claims**



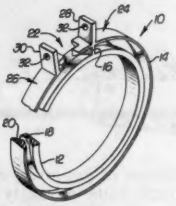
A sanitary napkin that incorporates a fluid impervious barrier of filmlike material having very poor structural stability but which is maintained in place when in use and during manufacture of the napkin by having its lateral marginal edges sandwiched between two relatively thick absorbent fibrous layers that form the absorbent core of the napkin. In one embodiment, the lateral edges of the barrier film are provided with perforations permitting the fibers of one layer of the absorbent core to interlock with the fibers of the next adjacent layer of the core to further enhance the holding of the barrier film in proper position in the napkin when worn and during its manufacture.

3,612,057
CIRCUMCISION DEVICE

Lawrence D. Freedman, 1541 Wilton Way, La Habra, Calif.

Filed Jan. 22, 1970, Ser. No. 4,984
Int. Cl. A61b *17/00*
U.S. Cl. 128—303 **9 Claims**

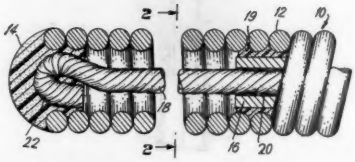
A circumcision clamp comprising a pair of concentric plastic rings connected by a generally radially oriented pillar or web so that the rings retain their concentricity when moved into operative position. The inner ring is uninterrupted or solid, and the outer ring is split, preferably adjacent to the pillar, to allow for expansion and contraction of the outer ring relative to the inner ring, the ends of the outer ring having means thereon for drawing them together into clamping position. The foreskin is pulled between the inner and outer rings, with the pillar engaged in the usual dorsal slit in the foreskin, to set the device proximate the base of the glans, and then the ends of the outer ring are drawn together to constrict the outer ring into clamping position. The rings preferably include opposed, complementary, annular irregularities to assist clamping and to assure that they remain aligned, as for example a V-shaped notch on the outside of the inner ring and a V-shaped projection on the inside of the outer ring.



3,612,058
CATHETER STYLETS

Bernard Ackerman, Edison Township, N.J., assignor to Electro-Catheter Corporation

Filed Apr. 17, 1968, Ser. No. 722,015
Int. Cl. A61m *25/00*
U.S. Cl. 128—348 **10 Claims**

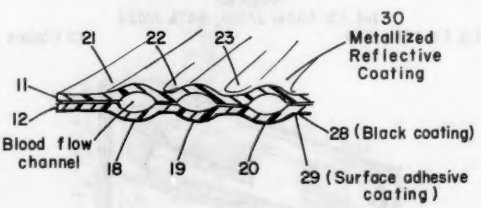


Catheter stylet having an elongated bodily flexible outer casing means comprising helically wound wire, and elongated reinforcing means extending generally axially therethrough comprising at least one strengthening portion.

3,612,059
HEAT EXCHANGER FOR BLOOD DURING TRANSFUSIONS

Robert A. Ersek, 8806 Minnetonka Blvd., Minneapolis, Minn.

Filed Mar. 5, 1970, Ser. No. 16,762
Int. Cl. A61f *07/00*
U.S. Cl. 128—399 **6 Claims**



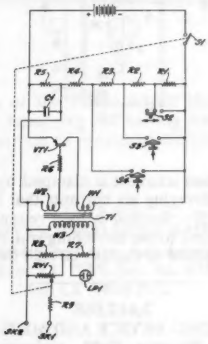
Means for controlling the temperature of intravenous fluids being administered to a patient and comprising a pair of relatively thin films of flexible silicone rubber bonded together to form a generally rectangular parallelepiped having a pair of opposed major surfaces and having a plurality of generally parallelly disposed flow channels extending therebetween, the flow channels being arranged transversely to the elongated axis of said parallelepiped; means defining

an inlet orifice along one edge thereof communicating with an inlet manifold at one end of said parallel flow channels and an outlet orifice along the opposite edge thereof communicating with an outlet manifold at the opposite end of said flow channels; and a highly thermally emissive coating applied along one of said major surfaces, and a highly thermally reflective coating applied to the opposed major surface.

3,612,060
PERIPHERAL NERVE STIMULATOR

John E. Colyer, Longueville, New South Wales, Australia, assignor to The Wellcome Foundation Limited, London, England

Filed Jan. 6, 1969, Ser. No. 789,265
Claims priority, application Australia, Jan. 5, 1968, 32,043/68
Int. Cl. A61n *1/36*
U.S. Cl. 128—422 **6 Claims**

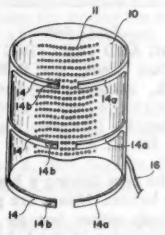


An electronic peripheral nerve stimulator is disclosed, the nerve stimulator comprising a power supply, a transistorized oscillator circuit coupled to the power supply and including at least one transistor and a resistance-capacitance network defining the oscillation frequency of the oscillator. The transistor is coupled in circuit with the resistance-capacitance network and means are provided to vary the effective impedance of the resistance-capacitance network to provide a selective output pulse repetition rate from the oscillator circuit. A transformer is provided, the transformer having a first primary winding coupled in circuit with the collector of the transistor, a secondary primary winding coupled in circuit with the base of the transistor and through which a "reflected" current is passed by way of a positive feedback loop to the transistor base, and a secondary winding from which an output pulse is obtained.

3,612,061
FLEXIBLE CUTANEOUS ELECTRODE MATRIX

Carter C. Collins, Mill Valley, and Robert Bowen, San Bruno, both of Calif., assignors to The Institute of Medical Sciences, San Francisco, Calif.

Filed Feb. 20, 1969, Ser. No. 800,948
Int. Cl. A61n *1/04*
U.S. Cl. 128—418 **8 Claims**

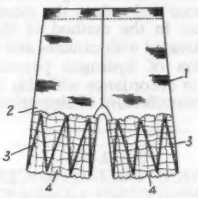


A porous sheet of elastic material supports an array of electrodes adapted to contact the wearer's skin. The sheet and electrodes are conformed to the wearer's body configuration by an outer less flexible sheath, interposed resilient material, and adjustable fastening means. The several electrodes are connected to a cable fed with electrical pulses adapted to produce a two-dimensional electrical skin stimulation pattern representing or depicting a visible object.

3,612,062
GIRDLE WITH LEGS OF THE SO-CALLED PANTIE TYPE

Andre Henri Silvain, 3, rue Nadaud, Roubaix, Nord, France

Filed Aug. 11, 1969, Ser. No. 849,008
Claims priority, application France, Sept. 20, 1968, 166940
Int. Cl. A41c *1/02*
U.S. Cl. 128—535 **3 Claims**



The invention relates to a girdle having legs in which, at the bottom of the legs, strongly elastic fabric constituting the whole of the girdle is cut along a broken line and vertical serrations thus formed are covered by a sleeve or low-grip elastic lace.

3,612,063
OXIDIZED CELLULOSE SMOKING PRODUCT

Theodore S. Briskin, and Geoffrey R. Ward, both of Beverly Hills, Calif., assignors to Sutton Research Corporation, Los Angeles, Calif.

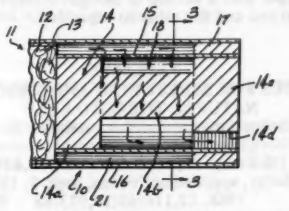
Continuation-in-part of application Ser. No. 802,229, Feb. 25, 1969, which is a continuation-in-part of application Ser. No. 595,622, Nov. 21, 1966, now Patent No. 3,447,539, and a continuation-in-part of 674,994, Oct. 12, 1967, now abandoned. This application Aug. 18, 1969, Ser. No. 851,104
Int. Cl. A24b *15/00*; A24d *01/18*
U.S. Cl. 131—2 **3 Claims**

Smoking products and process for their production wherein organic salts of potassium, lithium and copper, and titanium dioxide are incorporated into oxidized cellulosic materials for the purpose of controlling burning and for supporting glow between puffs. The potassium, lithium and copper organic acid salts employed are those of oxalic, lactic, glycolic, diglycolic, pivalic and tannic acid and in amounts less than 2 percent by weight.

3,612,064
SMOKE FILTER

John D. Woods, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Feb. 9, 1970, Ser. No. 9,515
Int. Cl. A24d *01/04*; A24f *01/08, 01/16*
U.S. Cl. 131—10.5 **6 Claims**



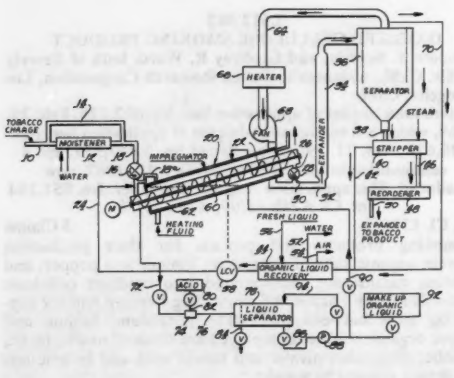
A smoke filter is provided which is adapted to be affixed to one end of a tobacco rod. The smoke upon passing through

the filter attains a very high velocity whereupon it impinges against a curved surface causing liquid and/or solid particles entrained in the high-velocity smoke to be deposited upon the impinged surface. The smoke, subsequent to impingement, follows a curved path prior to being discharged from the downstream end of the filter.

3,612,065
METHOD OF PUFFING TOBACCO AND REDUCING NICOTINE CONTENT THEREOF
William E. Rosen, Lafayette Hills, Pa., assignor to Creative Enterprises, Inc., Narbeth, Pa.
Filed Mar. 9, 1970, Ser. No. 17,881
Int. Cl. A24b *15/02, 03/18*
U.S. Cl. 131—140 P **15 Claims**

A method is provided for treating tobacco to increase the volume of the tobacco and reduce the nicotine and tar content of the tobacco. In the method of this invention, the tobacco is initially treated with catalase and then treated with an aqueous solution of hydrogen peroxide. The treated tobacco produced in accordance with this invention is especially useful in the manufacture of cigarettes and the like.

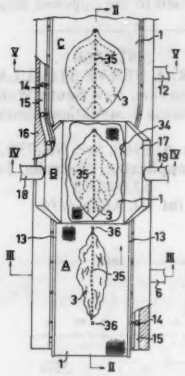
3,612,066
DENICOTINIZING PROCESS
Samuel O. Jones; James Gilbert Ashburn; Grant M. Stewart, and Glenn Philip Moser, all of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Feb. 5, 1970, Ser. No. 8,858
Int. Cl. A24b *15/02, 03/18*
U.S. Cl. 131—143 **7 Claims**



A process for denicotinizing tobacco is disclosed in which tobacco, in an impregnating zone, is subjected to the action of a pool of an organic fluid which is a nicotine solvent and has a boiling point less than that of water. The fluid treated tobacco is then conveyed into an upper portion of the impregnating zone where it is contacted with the organic solvent fluid from which some of the nicotine has been removed. This solvent then drains down to the solvent pool at the lower portion of the impregnating zone. The tobacco is then contacted with a stream of hot gas whereby the excess fluid is vaporized and the tobacco expanded.

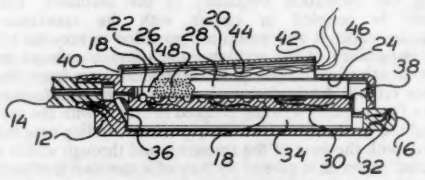
3,612,067
APPARATUS FOR STRETCHING AND SMOOTHING A NATURAL TOBACCO LEAF
Nils Wallenborn, Spanga, Sweden, assignor to Arenco Aktiebolag, Stockholm, Vallingby, Sweden
Filed Aug. 27, 1969, Ser. No. 853,418
Claims priority, application Sweden, Sept. 9, 1968, Nov. 4, 1968, 12,116/68;14,923/68
Int. Cl. A24b *05/04, 05/14*
U.S. Cl. 131—147 R **8 Claims**

An apparatus for stretching and smoothing tobacco leaves comprising an intermittently advanced, air permeable, stretchable conveyor belt for carrying leaves from a receiving station to a smoothing station to a stretching station. A moist leaf placed and aligned on the belt at the receiving station, and held thereon by suction through the belt, is advanced to



the smoothing station where it is clamped by its central vein and subjected to diverging air currents that flutter the edges of the leaf outwardly. Suction is then reapplied to hold the leaf and it is advanced to the stretching station where the belt is transversely stretched to thereby stretch the leaf as well.

3,612,068
SMOKING DEVICE AND METHOD
James H. Higbee, Banning, Calif., assignor to Marjorie L. Higbee, Banning, Calif., a part interest
Filed Dec. 10, 1969, Ser. No. 883,868
Int. Cl. A24d *01/12*
U.S. Cl. 131—175 **4 Claims**

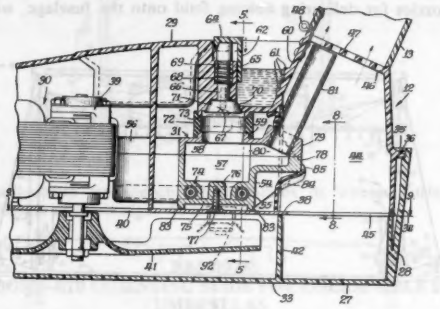


A holder with a mouthpiece adapted to wholly contain a burning cigarette and its ashes. The cigarette is disposed with its burning end adjacent the mouthpiece and its other end remote from but in communication with the latter via passageways which house filtering material whereby smoke drawn through the mouthpiece is rendered cool and mild. A cover over the cigarette has a hole for igniting the cigarette and is operable to guide smoke rising from the burning cigarette away from the mouthpiece.

3,612,069
HAIR DRYING AND TREATING APPLIANCE
Robert S. Waters, Oak Brook, and William H. Scott, Lombard, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 14, 1970, Ser. No. 2,735
Int. Cl. A45d *20/00*
U.S. Cl. 132—9 **13 Claims**

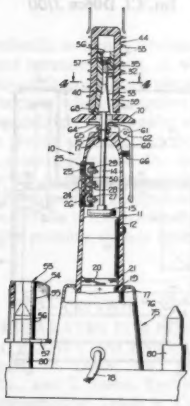
A hair dryer of the type having a base which supports a rigid head receiving helmet. Means are provided in the base to supply alternatively either hot air or steam which is discharged into the interior of the helmet through perforations in the inner wall of the helmet. The motor driven blower for supplying the hot air and the steam generator are

mounted within the base housing on a transversely extending metal supporting wall. Control means for the appliance permits selective alternative energization of either the steam



generating means or the motor driven blower and the air heater. Simplified measuring and valving means are provided to control the insertion of measured amounts of water into the steam generator.

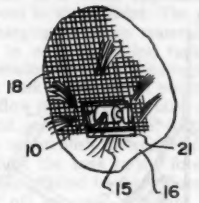
3,612,070
POWER-DRIVEN HAND-HELD HAIR CURLER
Robert M. Reyes, 614 Forest Ave., Los Angeles, Calif.
Filed June 23, 1969, Ser. No. 835,447
Int. Cl. A45d *2/12*
U.S. Cl. 132—34 **11 Claims**



A power-driven hand-held hair curler having provision for selectively supporting both hot and cold types of curler rolls and operable to roll hair thereonto in either direction at the user's option. The accessory includes a support stand for the curler itself and provision for storing the curler rolls in readiness for use as well as a battery recharger.

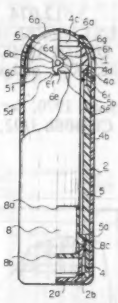
3,612,071
HAIRPIECE AND FASTENER
James A. Holly, Richton Park, Ill., assignor to Permalok International, Inc.
Filed Apr. 8, 1970, Ser. No. 26,729
Int. Cl. A41q *3/00*
U.S. Cl. 132—53 **8 Claims**

A wig comprising a hairpiece, a number preferably six to eight of individual fasteners that are attachable each to filaments of natural hair on the head to which the wig is to be attached and a receiver on the hairpiece for each fastener with the receivers and fasteners cooperating to provide releasable engagement so that the hairpiece is positively fastened to the



head of the wearer by means of filaments or strands of his own hair.

3,612,072
COSMETIC APPLICATOR
Kiyoshi Fukui, Saitama-ken, Japan, assignor to Shiseido Co., Ltd., Tokyo, Japan
Filed May 18, 1970, Ser. No. 38,240
Int. Cl. A45d *40/26*
U.S. Cl. 132—88.7 **8 Claims**

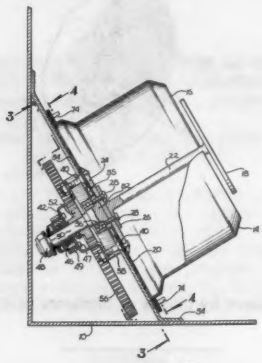


A capless cosmetic applicator provided with a finger piece and a cylindrical casing turnably engaged with the finger piece. The tip portion of the finger piece is opened and provided with a pair of shutter pieces swingably engaged with an inside wall thereof so that the shutter pieces are opened when a solid cosmetic contained therein is used or alternately closed when the applicator is not used. The opening or closing motion of the shutter pieces is operated by an actuating means disposed within the applicator when the finger piece is relatively turned with the cylindrical casing.

3,612,073
COIN PAYOUT MECHANISM FOR AMUSEMENT DEVICE
Carl D. Calos, Northridge, Calif., assignor to Centaur Mini Computer Devices, Inc., New York, N.Y.
Filed June 5, 1969, Ser. No. 830,677
Int. Cl. G07d *9/00*
U.S. Cl. 133—8 **6 Claims**

An amusement or gaming device is described which includes a payout device for paying out predetermined amounts of coins contained in a hopper within the gaming device. The payout mechanism includes a rotatably mounted

coin pickup plate which is adapted to rotate with the hopper in relation to a support plate and includes a plurality of holes therein which is adapted to pick up or catch coins therein and slide them out a corresponding and matching hole in the



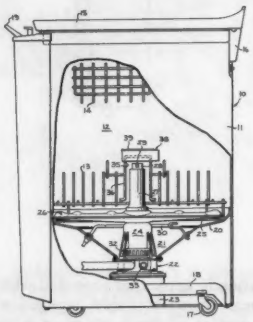
support plate. The coins are then fed through an output chute and into a payout receptacle. Switching mechanism is provided to count the amount of coins paid out through the output chute.

3,612,074

CLEANING AGENT DISPENSING DEVICE IN A DISHWASHER

Olin Dossey, Louisville, Ky., assignor to General Electric Company

Filed May 20, 1970, Ser. No. 38,934
Int. Cl. B08b *3/02, 13/00*
U.S. Cl. 134—93 **6 Claims**



In an automatic dishwashing machine of the type having a cabinet enclosing a wash chamber, dish supporting racks mounted in the chamber and fluid recirculation and distribution apparatus extending into the chamber, a manually fillable cleaning agent receptacle is mounted within the chamber so as to be responsive to the initial movement of a movable part of the fluid distribution apparatus whereby, when the machine is placed into operation, the receptacle is caused to discharge its load into the chamber.

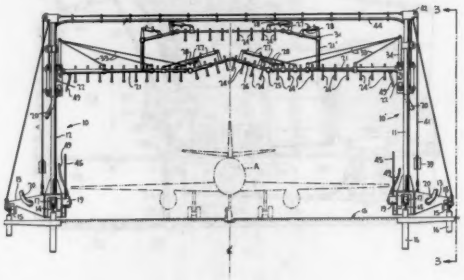
3,612,075

AIRCRAFT DEICING APPARATUS

Vernon H. Cook, RD 2, Far Hills, N.J.

Filed Jan. 14, 1969, Ser. No. 791,024
Int. Cl. B60s *3/00*
U.S. Cl. 134—99 **22 Claims**

Apparatus for deicing aircraft by means of a permanent structure capable of moving longitudinally between the ends of the aircraft and vertically adjustable to accommodate different aircraft heights. A frame, comprising a pair of vertical supports, is provided wherein a control cabin and an attached inwardly directed horizontal boom are mounted for vertical elevation on each support, the boom having spray nozzles for delivering deicing fluid onto the fuselage, wing,



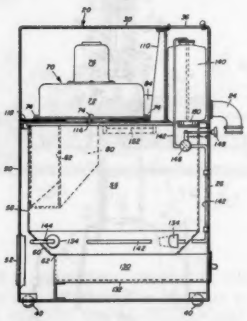
tail and control surfaces of the aircraft as the frame is moved therealong. The boom may be automatically adjustable to conform to the horizontal profile of a given aircraft and the control cabin is located just below the boom to enable the operator to maintain eye-level assurance that the aircraft is sufficiently freed from ice and snow.

3,612,076

FEATHER PROCESSING MACHINE

Harry Brahm, Miami, Fla., assignor to Elma, S.A., Panama City, Panama

Filed July 22, 1969, Ser. No. 843,453
Int. Cl. D06m *3/00*
U.S. Cl. 134—102 **9 Claims**



A feather processing machine comprising a cleaning drum, means for introducing soiled feathers into the drum, means for agitating the feathers within the drum and blower means outside of the drum in communication therewith for withdrawing feathers from the drum and discharging them from the machine.

3,612,077

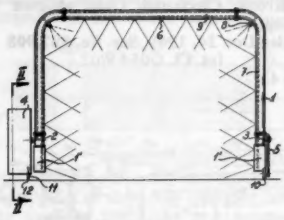
ADJUSTABLE VEHICLE-WASHING MACHINE

Uberto Capro, Vicenza, Italy, assignor to Ceccato & C.S.p.A., Vicenza, Italy

Filed May 16, 1969, Ser. No. 825,243
Claims priority, application Italy, May 29, 1968, 17072A/68
Int. Cl. B60s *3/04*
U.S. Cl. 134—123 **10 Claims**

A vehicle-washing machine includes an inverted U-shaped bridge which carries water and detergent nozzles. The bridge is pivoted near its bottom ends, each end having a counter-

weight. The pivots are on wheeled trolleys. One trolley has



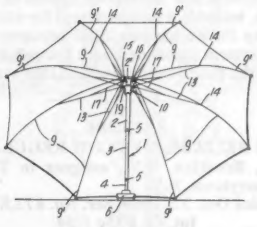
an adjustable mechanism which rotates its wheels during oscillation of the bridge.

3,612,078

DOME-RIB ORIENTING SLIDE FOR COLLAPSIBLE UMBRELLAS

Fritz Bremshey, Solingen-Ohligs, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada

Filed Dec. 1, 1969, Ser. No. 881,126
Int. Cl. A45b *19/06*
U.S. Cl. 135—26 **5 Claims**



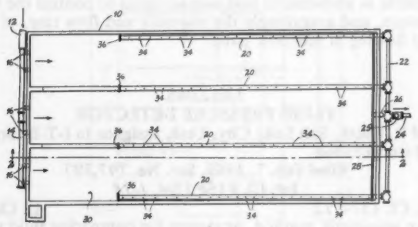
A collapsible umbrella including a telescopic stick, canopy, dome, auxiliary and spreader struts, in which a handle, primary slide, auxiliary slide and crown piece define a generally rectangular cross section when the umbrella is collapsed and stored in a correspondingly rectangular sheath; the primary slide having struts pivotally connected thereto and including laterally opening orienting means for engaging dome ribs generally adjacent the dome rib tips for orienting the dome rib tips into upwardly opening compartments or recesses of the handle as the umbrella is longitudinally collapsed and the sleeve portion of the primary slide is received in a tunnel or recess.

3,612,079

PROCESS AND APPARATUS FOR EQUALIZATION OF FLUID FLOW CONCENTRATION

George R. Schillinger, St. Louis, Mo.; Kenneth W. Axetell, Jr., St. Louis, Mo., and S. James Ryckman, Dayton, Ohio, assignors to Environmental Triple S. Company, St. Louis, Mo.

Filed July 17, 1969, Ser. No. 884,399
Int. Cl. C02c *1/00*
U.S. Cl. 137—1 **15 Claims**



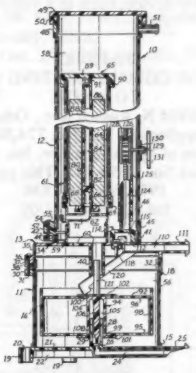
A process and apparatus for equalization of concentrations of fluid materials. The process and apparatus are designed for effluent discharges in industrial plants or sewage systems and the like in which slugs of high concentration of material are charged to an effluent waste or sewer line at intermittent periods. The process and apparatus tend to equalize the slug of high concentration to a value approaching normal or average concentrations in the effluent. The process and apparatus comprise charging the waste material with a slug of high concentration in an equalization tank in which the charge is made at a multiplicity of spaced regions in the tank. The charge into the tank is effected at points generally perpendicularly to the flow of fluid to the tank and the influent conduits are disposed generally parallel to the flow of fluid through the tank to accomplish the spread of the high concentration slug through the tank in the form of a "front," which is gradually composited in the effluent conduits and mixed with fluid of average pollutant concentration. Discharge from the tank is effected by a plurality of effluent conduits parallel to each other and to flow having a sealed end in the tank with openings at intervals throughout the length of the conduits for receiving the waste fluid. Thus, a value approaching equalization of the concentration in the effluent of the conduit is effected in the effluent line leading from the tank to discharge.

3,612,080

CHEMICAL FEEDER

Thomas E. Schneider, Jr., c/o Tesco Chemicals, Inc., 445 Bishop St. N.W., Atlanta, Ga.; Marion R. Carstens, and Homer J. Bates, c/o Georgia Institute of Technology, 225 North Ave., Atlanta, Ga.

Continuation-in-part of application Ser. No. 754,535, Aug. 22, 1968, which is a continuation-in-part of application Ser. No. 579,253, Sept. 14, 1966, which is a continuation-in-part of application Ser. No. 403,698, Oct. 12, 1964, now Patent No. 3,323,539, dated June 6, 1967. This application Jan. 19, 1970, Ser. No. 3,684
Int. Cl. B01d *11/02*
U.S. Cl. 137—2 **8 Claims**

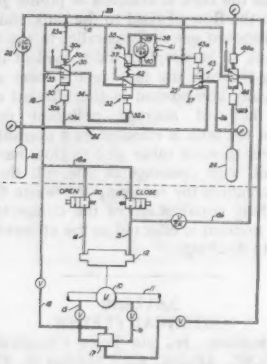


A chemical feeder for adding chemicals from a solid chemical compound into a body of water. The feeder includes a housing divided into upper and lower chambers, a tubular container positioned in the upper chamber for receiving a solidified chemical compound, a liquid inlet conduit communicating with the upper chamber, a liquid outlet conduit communicating with the lower chamber, valves controlling both conduits, and a float positioned in the lower chamber for operating both valves in response to the level of liquid in the lower chamber. The tubular container includes a plurality of apertures at spaced intervals about its lower end, and a nozzle extending inwardly from its lower end for flowing liquid from the upper chamber into contact with the solidified chemical compound to erode the compound. The mixture of liquid and eroded chemical compound then flows from the tubular container within the upper chamber to the lower chamber.

3,612,081
APPARATUS AND METHOD FOR MONITORING A FLUID PRESSURE SYSTEM

Jack L. Williams, El Paso, Tex., assignor to Textron, Inc.

Filed Aug. 17, 1970, Ser. No. 64,273
Int. Cl. F16k 17/20
U.S. Cl. 137—12 17 Claims

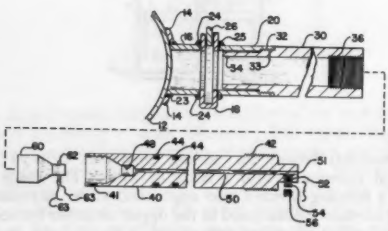


First and second volume chambers are connected to the fluid pressure system being monitored. Fluid from the system can flow to the chambers, but the fluid flow from the first of the chambers back to the system is restricted. Should the pressure differential between the system and the first chamber reach a predetermined amount, the second chamber is isolated from the system for a given period of time. If during this period of time the pressure differential between the second chamber and the system reaches a predetermined value, a signal is produced which signal may be used to actuate a device, such as a valve or warning signal.

3,612,082
APPARATUS FOR COMMUNICATING SERVICE LINES TO MAINS

Marcus L. Bates, 6904 N. Russell Ave., Odessa, Tex.

Continuation of application Ser. No. 774,802, July 15, 1968, which is a division of application Ser. No. 620,738, Mar. 6, 1967, now Patent No. 3,396,745. This application Jan. 6, 1970, Ser. No. 930
Int. Cl. F16k 51/00
U.S. Cl. 137—15 4 Claims

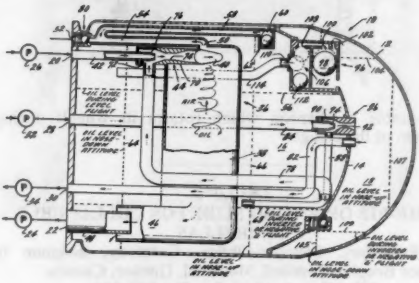


An apparatus for connecting a service line to a main line while fluid is flowing through the main line. The apparatus includes a mandrel which holds a shaped charge. When the mandrel is brought into close proximity to the main line and detonated, the wall of the main line is perforated by the explosive action of the shaped charge to thereby establish flow communication between the main line and a valve means. This action enables a lateral, or service line to be connected to the valve means without disconnecting the flow of fluid through the main line.

3,612,083
FLUID TANK

Richard M. Kronk, Cincinnati, Ohio, assignor to General Electric Company

Filed Dec. 24, 1969, Ser. No. 887,908
Int. Cl. G05d 9/02
U.S. Cl. 137—43 6 Claims

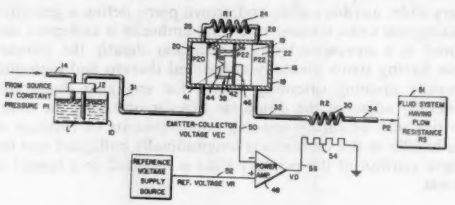


A fluid tank for use with two discrete fluid systems, such as the hydraulic system and lubrication system of an aircraft gas turbine engine, includes a compartment for each fluid system and a jet pump for exchanging fluid between one compartment and the system associated with the other compartment in response to the fluid requirements of that system.

3,612,084
HIGH RELIABILITY FLOW REGULATOR

Aaron Kassel, Brooklyn, N.Y., assignor to Technicon Corporation, Tarrytown, N.Y.

Filed Oct. 31, 1969, Ser. No. 872,815
Int. Cl. F15c 1/04
U.S. Cl. 137—81.5 13 Claims



New and improved flow regulator means are provided to maintain the flow of a fluid along a flow path at a substantially constant, predetermined rate and comprise pressure responsive means to generate an electrical signal proportional to the rate of flow of said fluid along said flow path, means to provide a reference, or set-point electrical signal, means to amplify the difference between said electrical signals and provide an output signal, and means to apply said output signal to flow controller means which take the form of temperature control means, having no moving parts, and are operable in response to said output signal to control the temperature, and accordingly the viscosity and flow rate, of said fluid flowing in said flow path.

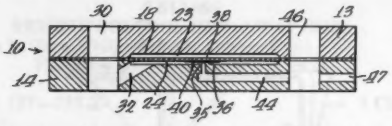
3,612,085
FLUID PRESSURE DETECTOR

Ruel R. Clark, Salt Lake City, Utah, assignor to I-T-E Imperial Corporation

Filed Feb. 7, 1969, Ser. No. 797,587
Int. Cl. F15c 3/04, 1/14
U.S. Cl. 137—12 12 Claims

An apparatus, method, or system for comparing fluid pressure input signals and providing an output signal proportional to the difference in pressure between the input signals, employing a housing having a flexible diaphragm separating the

housing into a reference chamber and a feedback chamber, there being provided an output port centrally disposed in the feedback chamber and adapted to be variably controlled by the diaphragm, with one of the fluid pressure signals being

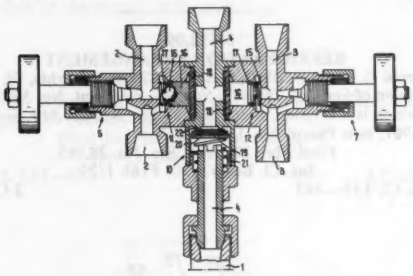


applied to the reference chamber and the other fluid pressure signal being applied to the other chamber, and a device for utilizing the signal in the outlet port representing the difference in pressure between the two input signals.

3,612,086
SUPPLEMENTARY DEVICE FOR USE ON A CUTTING TORCH

Alfred Roth, Talstrasse 30, 8102 Oberengstringen, Switzerland

Filed Sept. 22, 1969, Ser. No. 860,855
Claims priority, application Switzerland, Oct. 22, 1968, 15748/68
Int. Cl. G05d *16/06*
U.S. Cl. 137—87 **8 Claims**

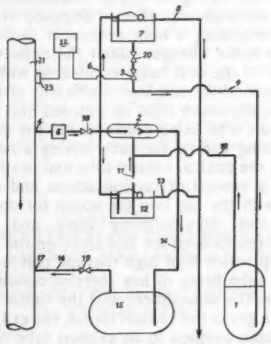


A supplementary device for use on a cutting torch having a fuel gas pipe, a heating oxygen pipe and a cutting oxygen pipe, comprising hand-regulating valves and bypass valves and pneumatic means for closing said bypass valves when cutting oxygen is admitted for changing the fuel gas and heating oxygen quantities from heating conditions to cutting conditions.

3,612,087
WATER TREATING DEVICE

Jurion Roland, Richwiller, France, assignor to Mines de Potasse d'Alsace S. A., Mulhouse, France

Filed Oct. 17, 1969, Ser. No. 867,217
Claims priority, application France, Oct. 17, 1963, 170259
Int. Cl. G05d *11/02*
U.S. Cl. 137—93 **4 Claims**

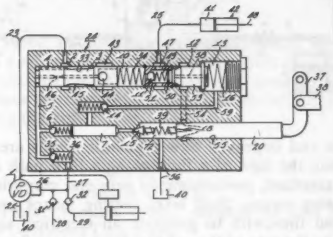


A device for treating water by controlled injection of bromine. A bromine storage vessel communicates with a dilution vessel-suction pump which continuously circulates water to be treated therethrough to maintain a negative pressure in the storage vessel. Dosing means communicates with the vessel to intermittently transmit predetermined amounts of brominated water to the dilution vessel.

3,612,088
THROTTLING DRAFT CONTROL VALVE

James R. McBurnett, Stillwater, Okla., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 3, 1969, Ser. No. 873,392
Int. Cl. F15b *5/00*
U.S. Cl. 137—116.3 **10 Claims**

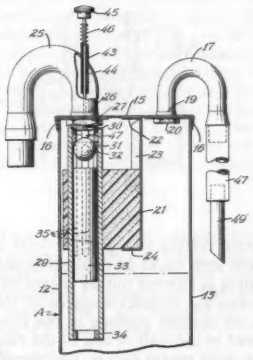


A throttling draft control valve having a pressure control chamber with fluid pressure feedback for supplying pressurized fluid to a hydraulic actuator and releasing the pressurized fluid from the hydraulic actuator and releasing the pressurized fluid from the hydraulic actuator at a controlled rate in response to a position signal.

3,612,089
VACUUM REACTIVATOR

Luis Beguiristain, St. Paul, Minn., assignor to Torit Corporation, Ramsey County, Minn.

Filed Oct. 28, 1968, Ser. No. 771,181
Int. Cl. A61c *17/04*
U.S. Cl. 137—205 **1 Claim**

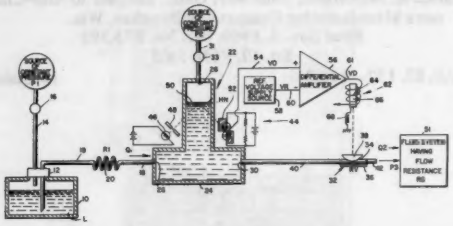


A vacuum reactivator is provided for use with an oral evacuator used to draw water, tooth chips and the like to a collector chamber. The chamber is automatically drained when the suction is turned off. A ball float valve is provided to turn off the vacuum when the liquid in the chamber reaches a predetermined depth, emptying the chamber of water. A plunger is provided for manually disengaging the ball valve from its seat after the chamber has been drained to restore vacuum.

3,612,090
FLOW REGULATOR HAVING NO GAS-LIQUID DIAPHRAGM INTERFACE

Aaron Kassel, Brooklyn, N.Y., assignor to Technicon Corporation, Tarrytown, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,034
Int. Cl. G05d *7/06, 9/12*
U.S. Cl. 137—209 **13 Claims**

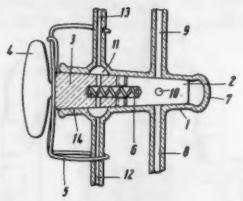


New and improved flow regulator means are provided to maintain the flow of a fluid along a flow path at a substantially constant, predetermined rate and comprise fluid level indicating means, fluid level sensing means operatively associated therewith to generate an electrical signal proportional to the rate of flow of said fluid in said flow path, means to provide a reference or set-point electrical signal, means to amplify the difference between said electrical signals and provide said amplified difference as an output signal, and means to apply said output signal to electromechanically operable, variable flow area flow controller means to control the flow resistance thereof and accordingly control the flow rate of said fluid in said flow path.

3,612,091
GASTIGHT JOINT

Wolfgang Gramann, Nd-Gemunden, and Helmut Holzer, Heilbronn, both of Germany, assignors to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm/Danube, Germany

Filed Aug. 28, 1969, Ser. No. 853,815
Claims priority, application Germany, Sept. 2, 1968, P 17 75 617.1
Int. Cl. F16k *5/02;* **F16l** *49/00*
U.S. Cl. 137—312 **8 Claims**



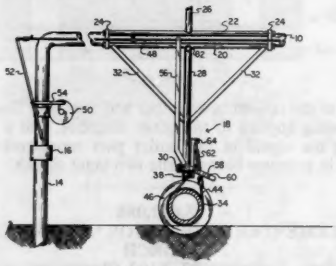
The invention relates to a gastight joint, for example, for sealing gastight stop cocks or in joints between tubular parts in which sealing is carried out by means of an auxiliary gas flowing between the contact surfaces of the two parts. For this purpose an annular passage in the form of a bead like bulge is formed in the wall of one of the two parts. A sealing substance e.g. joint grease may be additionally used.

3,612,092
MUD PIPE MOVER

Ralph D. Boone, 2920 Axtell, Clovis, N. Mex.

Filed May 28, 1968, Ser. No. 732,779
Int. Cl. B05b *9/02;* **E01h** *3/02*
U.S. Cl. 137—344 **7 Claims**

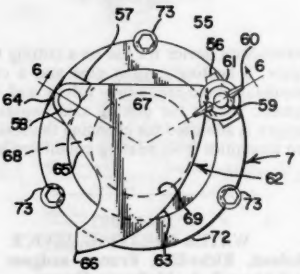
An irrigation pipe to be moved constantly as it waters is supported by a plurality of vehicles. The ground engaging element of each vehicle is an elongated cylinder having a helical vane thereon so that rotation of the cylinder moves the vehicle along the earth as by an auger. The cylinder is rotated by an encircling band similar to a capstan or brake band. Power is transmitted to each vehicle by a reciprocating cable. To support the pipe, a mast is mounted on each vehicle and guy wires extend from the mast to the pipe. To compensate for uneven ground, a spreader is mounted on the pipe between vehicles and stays extend over the spreader to the vehicles which prevents the pipe from substantially bending upward between vehicles.



3,612,093
REFRIGERATION ARRANGEMENT

Harold E. Gramse, RR 2, Box 220, Chicago Heights, Ill.

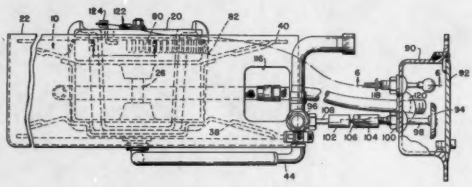
Division of Ser. No. 785,847, Nov. 25, 1968, Pat. No. 3,570,262, which is a division of application Ser. No. 669,819, Sept. 22, 1967, now Patent No. 3,447,336
Filed May 20, 1970, Ser. No. 38,985
Int. Cl. B60p *3/20;* **F16k** *1/20*
U.S. Cl. 137—347 **2 Claims**



A refrigeration arrangement for a railroad car comprising a source of liquid nitrogen under a vapor pressure attendant to delivery of the nitrogen, under thermostatic control, to a converging atmospheric collector disposed within the car, the collector comprising a heat exchanger including encircling coils of the liquid nitrogen about the collector's scoop, the trailing end of the coil being connected with a tube of low thermal conductivity and low coefficient of friction and extending into the scoop from its widened end to its shortened end, a venturi tube being connected to the end of the scoop and the exiting end of the tube having a nozzle being surrounded by the conical venturi tube end portion of the scoop to develop a venturi or suction action and drawing the atmosphere with the car into the scoop for cooling of the atmosphere and dehumidifying same and for depositing moisture in the form of ice and show on the interior surface of the scoop which is of high thermal conductivity material, the venturi tube being of low thermal conductivity material and receives the atmosphere and the liquid nitrogen which expands to a gas in the venturi throat, the exit end of the venturi tube being coupled to an exhaust tube opening into the car, the exhaust tube being of low thermal conductivity and having an outside air tube connecting with its entrant part and with an outside air control valve on the car for mixing of

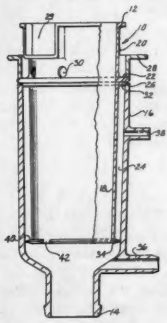
outside air and the car atmosphere and nitrogen gas for dispersal into the car environment.

3,612,094
REMOTE CONTROL HIDE-AWAY HOSE
William R. Hare, 6960 Oak Ave., Folsom, Calif.
Filed May 12, 1969, Ser. No. 823,874
Int. Cl. B65h *75/34, 75/30*
U.S. Cl. 137—355.2 **1 Claim**



A garden hose mounted inside a building on a reel and adapted to be withdrawn for outside use. Spring means automatically rewinds the hose. A brake and a water valve are controlled on the outside of the building.

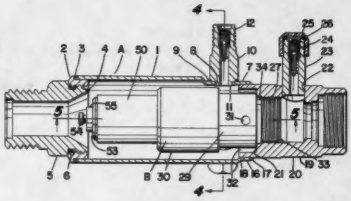
3,612,095
WASHING MACHINE SUMP
Robert B. Beare, and Curtis R. Hartley, both of Herrin, Ill., assignors to Fedders Corporation, Edison, N.J.
Filed Jan. 20, 1970, Ser. No. 4,294
Int. Cl. D06f *39/00, 39/02*
U.S. Cl. 137—403 **4 Claims**



An improved washing machine sump is provided which includes an air chamber in communication with an air pressure actuated water level control. The air chamber is defined between the body of the sump and the outer surface of an inner liner. The inlet to the sump forms the top portion of the liner and the outlet from the sump comprises the bottom of the body member. The bottom of the liner is spaced upwardly from the bottom of the body member and a seal is provided extending between the body member and liner proximal the top of the body member to define a top for the air chamber.

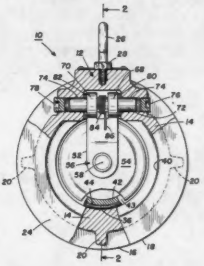
3,612,096
PILOT OPERATED FLOW CONTROL VALVE
Arthur S. Kish, Lyndhurst, Ohio, assignor to Murray Corporation, Cockeysville, Md.
Filed July 30, 1969, Ser. No. 846,178
Int. Cl. F16k *31/38*
U.S. Cl. 137—454.5 **4 Claims**

A valve is provided which is characterized by the use of an external housing of simple construction, and which can be easily taken apart to provide access to the parts within the housing. The interior of the valve is composed of units or subassemblies which can be quickly and easily removed for repair or replacement and without any possibility of the elements constituting such units or subassemblies becoming disconnected from each other and falling apart. A particular feature is a slide valve subassembly consisting of a valve



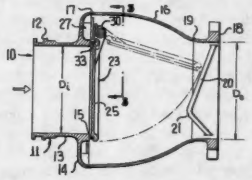
body, piston valve, bellows housing and adjusting valve assembled as a complete easily handled unit. Still another feature is the elimination of certain springs used in similar valves, to reduce the cost of the valve, without impairment of the functioning thereof.

3,612,097
CHECK VALVE
Darryll G. Prince, Norman, Okla., assignor to K-F Prince Valve, Inc., Oklahoma City, Okla.
Filed Oct. 14, 1968, Ser. No. 767,075
Int. Cl. F16k *15/03*
U.S. Cl. 137—527.4 **6 Claims**



A wafer check valve is described having a generally cylindrical body with an axial length approximately one-third the diameter. A pivoted clapper assembly is spring biased against an annular seat disposed normal to the axis of the body to provide a fluid passageway of maximum diameter. The annular seat is formed by a noncorrosive seat ring which interferingly fit in the body. A resilient O-ring seal seals the joint between the seat ring and the body. In one embodiment, the seat ring includes a resilient seating surface. The clapper assembly includes a disk-shaped clapper loosely connected to a spring-biased pivot arm by a brad welded to the clapper.

3,612,098
LIGHTWEIGHT VALVE ASSEMBLY
Ronald E. Bora, Torrance; Charles R. Clark, Redondo Beach, and Larry C. Mittell, Palos Verdes Estates, all of Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio
Filed June 3, 1969, Ser. No. 829,985
Int. Cl. F16k *15/03, 15/06*
U.S. Cl. 137—527 **10 Claims**



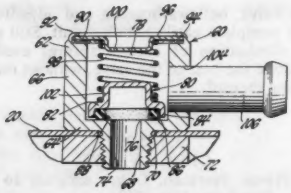
This disclosure relates to a valve assembly for use in aircraft. The assembly includes a main body secured to an

adapter and a check valve disposed within the body and mounted on the adapter. The body and as much of the adapter as possible are constructed of very thin material relative to thicker coupling portions of the adapter whereby the valve assembly is of an extremely lightweight construction.

3,612,099
PRESSURE RELIEF VALVE FOR PRESSURIZED FUEL TANK

Daniel Charles MacManus, Owosso, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 22, 1970, Ser. No. 39,793
Int. Cl. F16k *17/04*
U.S. Cl. 137—540 1 Claim

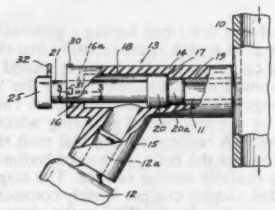


A pressurized fuel tank is disposed transversely over the rear axle of an automobile. A pressure relief valve, discharging from the fuel tank adjacent the vehicle centerline, has a spring-biased valve member carrying an "O"-ring which seats on the valve body; the valve member is raised against the bias of the spring to relieve pressure in the tank.

3,612,100
VACUUM VALVE

Martin Kapeker, 41 Decker St., Copiague, N.Y.

Filed Apr. 13, 1970, Ser. No. 27,502
Int. Cl. F16k *11/07, 37/00*
U.S. Cl. 137—556.6 10 Claims

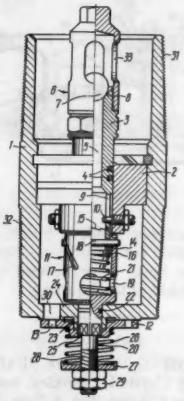


A valve for connecting a flask, an ampul, or any other vessel to be evacuated to a vacuum supply system comprises a tube with which a second tube communicates at a point intermediate the ends of the first tube. One end of the first tube is attachable to a port of the supply system and the other end of the tube is closed by an end wall. The free end of the second tube serves as connector for the flask, etc. to be evacuated. A plunger within the first tube can be displaced by a rod extended through an opening in the end wall of the tube either into a position in which the second tube is connected to the port through the first tube or into a position in which it is closed off from the port. While the second tube is closed off from the port, it can be connected to the atmosphere via a vent port in the end wall of the first tube by turning the plunger into a predetermined angular position in which a slot in the wall of the rod is in registry with the vent and also in connection with the second tube. The resulting venting of the second tube breaks the vacuum produced in a flask, etc. attached to the second tube. The flask can now be removed from the valve without disturbing the vacuum in the supply system.

3,612,101
BOTTOM HOLE FLOW BEAN

Vladimir Pavlovich Maximov, ulitsa Volodarskogo, 43, kv. 35; Leonid Fedorovich Volkov, ulitsa Respubliki, 176, kv. 48; Albert Stepanovich Fomin, ulitsa Sevastopolskaya, 23, kv. 21, and Alexandr Alexandrovich Karabanov, ulitsa Respubliki, 171, kv. 71

Filed May 1, 1970, Ser. No. 33,686
Int. Cl. F16k *21/00*
U.S. Cl. 137—614.2 2 Claims



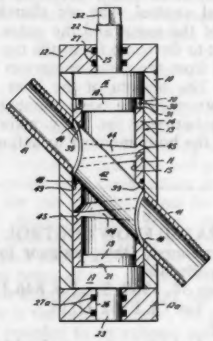
The invention relates to adjustable bottom hole flow beams used in petroleum industry, mainly in flow production for controlling the flow of fluid from the hole.

The invention consists in that the hydraulic mechanism for controlling an element serving to vary the bean flow area is arranged directly in the flow bean body and made as a piston with a conduit communicated with the hole space and accommodating a nonreturn valve, and a means adapted to turn the element serving to vary the bean flow area, with which means the piston interacts during its displacement with the closed nonreturn valve.

3,612,102
ROTARY CONTROL VALVE

Eldon E. Hulsey, P. O. Box 533, Conroe, Tex.

Continuation-in-part of application Ser. No. 699,947, Jan. 23, 1968, now Patent No. 3,558,100, which is a continuation-in-part of application Ser. No. 604,414, Dec. 23, 1966, now Patent No. 3,443,793. This application Apr. 20, 1970, Ser. No. 29,886
Int. Cl. F16k *5/10*
U.S. Cl. 137—625.3 6 Claims



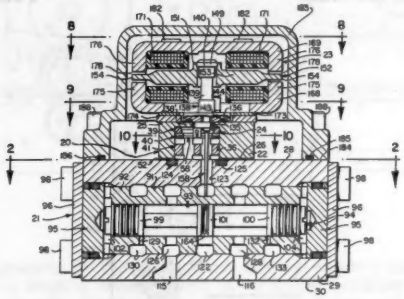
A rotary control valve of the hollow plug or ball type having spiral variable area orifice flow ports in combination with

an uninterrupted full-open through-conduit passage adapted to permit selective and variable control of fluid flow over a wide range of settings while maintaining at all settings substantially straight-line or through-conduit flow.

3,612,103
DEFLECTABLE FREE JETSTREAM-TYPE TWO-STAGE SERVO VALVE

Martyn V. Waddington, West Seneca, N.Y., assignor to Moog Inc., East Aurora, N.Y.

Filed July 1, 1969, Ser. No. 838,261
Int. Cl. F16k *11/00;* **F15b** *13/044*
U.S. Cl. 137—625.63 **9 Claims**

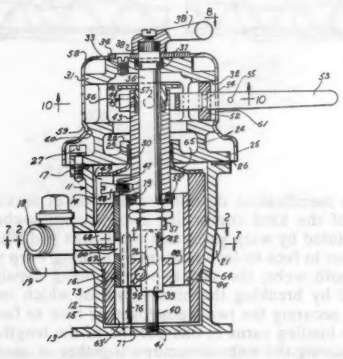


An easy to manufacture and service two-stage servo valve of the deflectable free jetstream-type is provided having a split body construction, part of which houses the second-stage or output valve spool which controls the flow of fluid through actuating ports with respect to supply and return ports, and the other part of which supports the jet deflector hydraulic amplifier and torque motor to constitute a separable first-stage assembly. Although there is mechanical force feedback between the valve spool and armature of the torque motor, the servo valve is so constructed that no feedback forces are transmitted through the jetstream deflector. This enables the deflector to be designed as a nonstructural element for ease of manufacture and made of a material having the desired physical characteristics such as one resistant to fluid erosion.

3,612,104
MIXING AND DIVERTER WATER VALVE

Agustin A. Busquets, 404 Virginia Ave., Apt. 6, Royal Oak, Mich.

Filed July 25, 1969, Ser. No. 844,812
Int. Cl. F16k *11/20*
U.S. Cl. 137—637.4 **4 Claims**

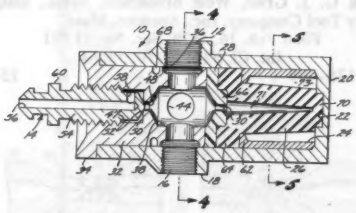


A fluid mixing valve having a pair of hot and cold water inlets and two axially spaced outlets and a pair of additional spaced outlets, with a rotatable valve sleeve for establishing selective communication of said inlets with any one of the three sets of outlets, and variably controlling the volume of flow from said inlets to a mixing chamber, and a pair of separate opposed valve elements mounted within said valve sleeve for independent axial adjustments, one valve element having an inlet port to control the temperature of fluids into said mixing chamber and an outlet in registry with one of said body outlets, the other of said valve elements having a pair of outlet ports in registry respectively with the other body outlets and wherein axial adjustment of the second valve element determines the flow of fluid from the mixing chamber through either or both of the axially adjacent pair of body outlets.

3,612,105
PRESSURE PEAK SUPPRESSORS

Harold W. Martin, 18602 Beachmont Ave., Santa Ana, Calif.

Filed May 12, 1969, Ser. No. 823,915
Int. Cl. F16l *55/04*
U.S. Cl. 138—30 **6 Claims**



This invention relates to pressure peak suppressors of the accumulator type for fluid pressure systems. The embodiment illustrated employs an elastomeric diaphragm in the form of a tube closed at one end by an integrally formed wall. The other end of the tube is covered by an end member to form a container for system fluid. Communication to the interior of the tube, or container, is afforded through an orifice in the end member. The diaphragm part of the container is arranged so that the incremental pressure required to deform it increases with the degree of its deformation. The end member is arranged so that less resistance is offered to flow out of the container. The diaphragm has uniform wall thickness over the length of its tubular section but the diameter of its central opening diminishes along its length. In the end member, the orifice increases in cross-sectional area in the direction from the interior to the exterior of the tube. The whole container is disposed within an outer housing or container.

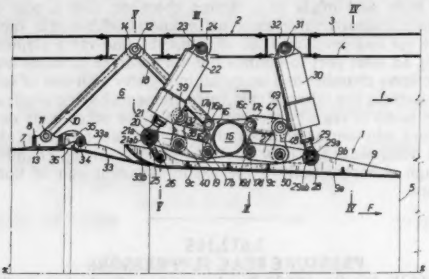
3,612,106
ARRANGEMENT FOR CONTROLLING AND SUPPORTING A VARIABLE-GEOMETRY DUCT

Andre Alphonse Mederic Leon Camboulives, Billancourt; Jean-Claude Lucien Delonge, Moissy-Cramayel, and Roger Alfred Jules Vandenbroucke, Antony, all of France, assignors to Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation, Paris, France

Filed July 2, 1970, Ser. No. 51,894
Claims priority, application France, July 3, 1969, 6922624
Int. Cl. F15d *1/08;* **B64c** *15/04, 15/06*
U.S. Cl. 138—45 **9 Claims**

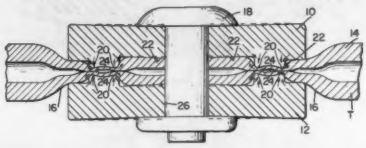
An arrangement for controlling and supporting within a fairing a duct whose section is controllable by means of flaps, said arrangement comprising a transverse body extending within the space defined between said duct and the fairing and being connected to the fairing through the medium of articulated arms, each of the flaps being suspended from said

body through the medium of two independent, adjustable



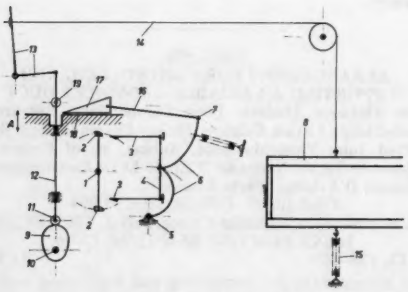
linkages respectively articulated to two zones of the flap which are axially spaced from one another.

3,612,107
GAS PROOF TUBE CLOSURE SEAL
Frederick G. J. Grise, West Brookfield, Mass., assignor to Novelty Tool Company, Inc., Spencer, Mass.
Filed Feb. 16, 1970, Ser. No. 11,581
Int. Cl. F16l *55/10, 55/14*
U.S. Cl. 138—89 **15 Claims**



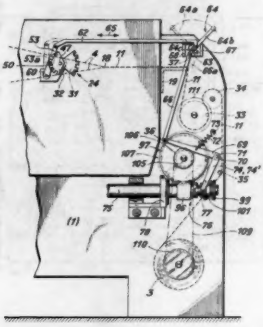
A closure is for floating tube, including two pair of part being provided with a multiple rib structure cooperating to squeeze the tube, deforming the same and flowing material thereof in an inward direction upon itself, between the ribs.

3,612,108
METHOD AND DOBBY FOR WEAVING MIXED WEAVE FABRICS
Rudolf Schwarz, Horgen-Zurich, Switzerland, assignor to Staubli Ltd., Zurich, Switzerland
Filed Apr. 7, 1969, Ser. No. 813,888
Claims priority, application Switzerland, Apr. 8, 1968, 5217-68
Int. Cl. D03c *7/00*
U.S. Cl. 139—50 **11 Claims**



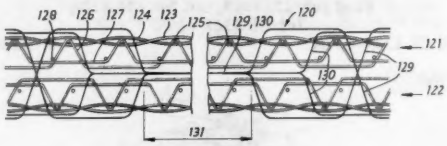
A method of operating a loom having heald frames operable to three positions comprising a lower shed position and an upper shed position for effecting a normal weave and a half shed position intermediate the other two positions for effecting a leno weave. The loom has a first and a second operating mechanism for weaving mixed fabrics.

3,612,109
WEAVING MACHINE
Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland
Filed Feb. 19, 1970, Ser. No. 12,738
Claims priority, application Switzerland, Mar. 18, 1969, 4023/69
Int. Cl. D03d *47/24, 49/20*
U.S. Cl. 139—126 **6 Claims**



The cloth takeoff mechanism is connected over a releaseable coupling to the drive mechanism of the machine so as to be selectively disengaged by the hand lever should a weft yarn break occur. The hand lever also actuates the locking device so as to prevent the Jacquard mechanism from rotating the multiple-weft mechanism segment.

3,612,110
WOVEN TAPES
Gerald Charles Wildi, Hadlow Down, Sussex, and Horace Dunbar Brand, Selsdon, Surrey, both of England
Filed Oct. 22, 1968, Ser. No. 769,683
Int. Cl. D03d *25/00, 23/00*
U.S. Cl. 139—383 **10 Claims**

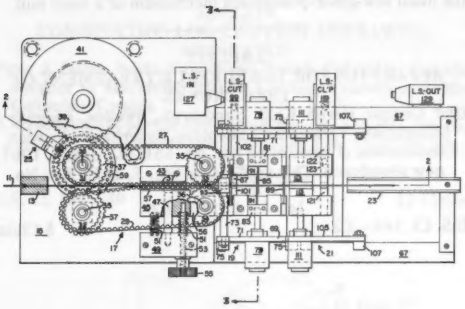


The specification describes a method of making a woven tape of the kind comprising two separate webs which are constituted by warp yarns and weft yarns and which are held together in face-to-face relation by binding warp yarns woven into both webs, the said two webs being capable of being parted by breaking the binding yarns, which method comprises securing the two webs together face to face by means of the binding yarns in one portion of the length of the tape and leaving the webs unsecured together in another portion of the length of the tape. The binding yarns conveniently extend continuously through said other portion of the tape and can be disposed between the two webs or woven into one of the webs in said other portion.

3,612,111
WIRE CUTTING AND STRIPPING APPARATUS

Heinrich F. Meyer, Liverpool, N.Y., assignor to General Electric Company

Filed Sept. 29, 1969, Ser. No. 861,970
Int. Cl. B21f *11/00, 21/00;* **H02g** *1/12*
U.S. Cl. 140—1 **6 Claims**

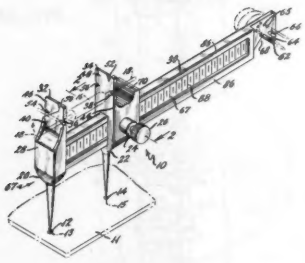


Apparatus for cutting insulated electrical wire into connectors or leads of desired length and stripping insulation from the cut ends. The apparatus accepts both manual and automatic (N/C) settings of wire length, permits change of length setting from piece to piece at will of the operator, provides good accuracy of wire length measurement even on the first piece cut after each change in length setting, and provides a cut and strip action which avoids kinking or bending of the ends of wires as dispensed from the apparatus. To accomplish these ends the apparatus comprises a continuous belt-type transport mechanism for wire feed with protection against wire slip being afforded through pressure-loading means assuring at least line contact between the belts and wire over a substantial length thereof, photosensor means for measuring the distance of belt travel to thus accomplish accurate measurement of wire length and enable its precise control, and simplified mechanism for wire cutting and stripping and for ejection both of the wire and of the stripped insulation.

3,612,112
ELECTRONIC COMPONENT FORMING TOOL

William Jordan Siegel, Silver Spring; Linus E. Wallgren, Rockville, and Loring E. Young, Frederick, all of Md., assignors to Pace, Incorporated, Silver Springs, Md., by said Wallgren and said Young

Filed June 2, 1969, Ser. No. 829,301
Int. Cl. B21f *1/00, 45/00*
U.S. Cl. 140—102.5 **5 Claims**

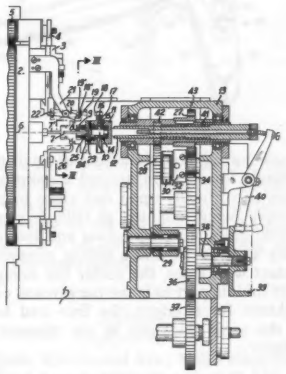


The present invention relates to a handtool for forming the leads of electronic components into just the right size and shape for insertion into a circuit board. As shown by the drawing the tool itself comprises an integral T-shaped member with a tailpiece slidably mounted on the leg thereof and capable of being locked thereto. The headpiece portion of the T-shaped member and the slidable tailpiece are in an opposing mirrorsimage relationship with a set of end portions formed as a pair of locator tips and the opposing end portions as parallel planar surfaces. The planar surfaces have matching apertures therein. When the locator tips are set for the component space, the tailpiece is locked to the leg. Then an electrical component can be positioned between the planar surfaces, and the leads placed in the apertures. Thereafter if the leads are bent against the marginal edges of the apertures the lead spacing will be sized in accord with the distance between the locator tips.

3,612,113
AUTOMATIC MACHINES FOR MAKING STEEL WIRE SPRINGS

Rene Perrenoud, Rue des Sugits 14, 2114 Fleurier, Switzerland

Filed Apr. 23, 1969, Ser. No. 818,687
Claims priority, application Switzerland, Aug. 13, 1968, 12164/68
Int. Cl. B21f *3/00;* **B21d** *3/02*
U.S. Cl. 140—103 **5 Claims**

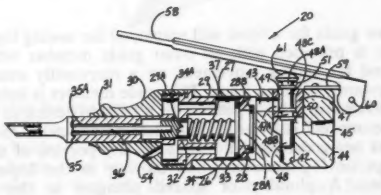


A machine for making steel wire springs intended particularly for the watchmaking industry has a tray on which are mounted shaping tools movable towards the center of the tray where is positioned a rolling stud. Means are provided for moving, clamping and cutting the steel wire and comprises a spindle rotatably mounted in front of the rolling stud. The spindle is also mounted for longitudinal movement and means are provided for controlling both the longitudinal advancement and rotation of the spindle to effect winding of the steel wire at a given angle around the rolling stud.

3,612,114
WIRE CUTTING AND BENDING TOOL

James A. Pawloski, box 158, Woodstock, Conn.

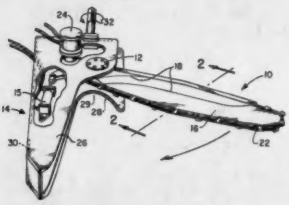
Filed Apr. 23, 1969, Ser. No. 818,754
Int. Cl. B21f *15/00*
U.S. Cl. 140—106 **5 Claims**



This disclosure is directed to a power tool for cutting and bending or laying over wire, and the tool is particularly

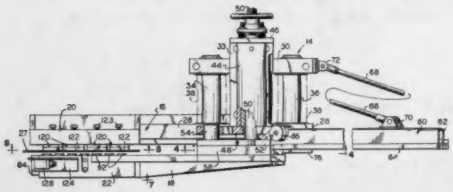
adapted for use in the manufacture of printed circuits or circuits boards. The tool comprises a housing having a fluid-actuated piston to which a cutting quill is mounted for movement relative to a quill guide extending forwardly of the housing. The tip end of the quill guide is provided with a notch for receiving a wire to be cut transversely to the movement of the quill. The improvement resides in the specific construction of the tip end of the quill which greatly improves and enchances the cutting and layingover action of the tool.

3,612,115
CHAIN SAWS
Alva Z. Albright, P.O. Box 762, Woodstock, Ontario, Canada
Filed Nov. 17, 1969, Ser. No. 877,335
Int. Cl. A01g *23/08;* **B27b** *17/02*
U.S. Cl. 143—32 N **3 Claims**



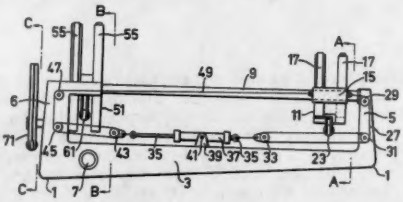
A chain saw having a straight-backed anvil mounted on a powered vehicle for rotation around an approximately longitudinal axis to vertically open and close to pick up felled trees, said anvil being indented to initially engage trees for felling to avoid detracking saw chain and the free end being longitudinally tapered to make sliding contact rather than butting contact with trees, the cutter bar being transversely tapered in its middle part to leave the pivoted end of said bar at full thickness for strength, the free end being flat and thinned to the same thickness as the thinnest part of said transverse taper.

3,612,116
BAND MILL SAW GUIDE
Arthur M. Ferrari, Barnham Ave., Corning, Calif.
Filed Dec. 4, 1969, Ser. No. 882,165
Int. Cl. B27b *13/10*
U.S. Cl. 143—160 R **16 Claims**



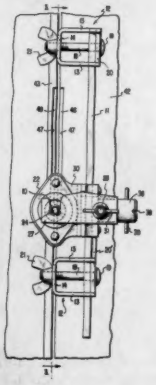
A saw guide for a band mill employed for sawing logs into lumber is provided with an outer guide member which is mounted for sliding movement on a rearwardly extending and upwardly inclined track. This guide member is held in its forward or saw-guiding position by a friction device so that it will be moved rearwardly and upwardly out of the way without being damaged if struck by any portion of the log carriage or log thereon when moving in the log-cutting direction. A plurality of spaced plungers in this guide member are urged toward the side of the saw by air under a predetermined pressure to hold the saw against an inner guide member on the other side of the saw, while at the same time water under a predetermined pressure urges the plungers away from the saw with lesser force so that release of the air pressure rapidly moves the plungers away from the saw. One or more feeler elements are positioned in front of the guide to sense the approach of any portion of the carriage or log which would strike the outer guide member during movement of the carriage in the log-cutting direction. Such movement causes release of the air pressure and also causes rapid upward movement of the entire saw guide by the usual saw-guide-positioning mechanism of a band mill.

3,612,117
APPARATUS FOR THE SURFACE TREATMENT OF TREE TRUNKS
Olof Gunnar Herolf Kjell, Sundsbruk, Sweden, assignor to Soderhamns Verkstader Aktiebolag, Soderhamn, Sweden
Continuation of application Ser. No. 651,732, July 7, 1967, now abandoned. This application Nov. 5, 1970, Ser. No. 87,350
Int. Cl. A01g *23/02*
U.S. Cl. 144—2 Z **5 Claims**



An apparatus for the surface treatment of trees having a frame extending along the tree to be worked upon and a surface-treatment and tree-feeding assembly mounted on and movable along the frame. The assembly is adapted to move back and forth in the longitudinal direction of the tree and has surface-treatment members and tree-gripping members thereon, the latter being adapted to hold the tree while the assembly is moved in one direction and release the tree upon movement in the opposite direction.

3,612,118
METHOD AND APPARATUS FOR SIMULTANEOUSLY MORTISING BUTT SEATS IN A DOOR AND ITS JAMB
Russell K. Davis, 308 S. Lanvale Ave., Daytona Beach, Fla.
Filed Sept. 4, 1969, Ser. No. 855,139
Int. Cl. B27f *5/12*
U.S. Cl. 144—27 **3 Claims**



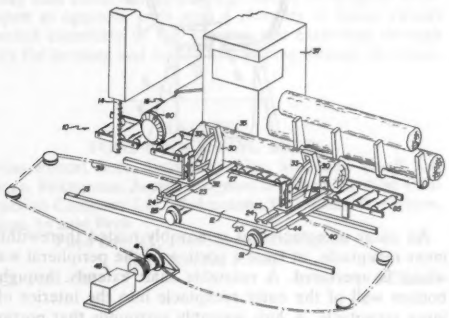
Matching seats for hinge leaves are cut simultaneously in a door and its jamb while the door is fixed temporarily in the jamb in service position. A series of overlapping cylindrical

bores centered on the longitudinal median of the clearance crack between the door and jamb is plunge cut simultaneously half in the door and half in the jamb by a single rotary cutting tool which then is traversed longitudinally along the series to remove the material remaining between the overlaps, thereby providing parallel straight sidewalls constituting a mortise in the door and jamb complemental to a hinge by which the door is to be hung.

3,612,119
COMBINATION LOG CHIPPING AND SAWING APPARATUS

Peter J. Neild, North Vancouver, British Columbia, Canada, assignor to MacMillan Bloedel Limited, Vancouver, British Columbia, Canada

Continuation-in-part of application Ser. No. 688,497, Dec. 6, 1967, now abandoned. This application Feb. 19, 1970, Ser. No. 12,687
Int. Cl. B27b *25/00*
U.S. Cl. 144—39 **12 Claims**

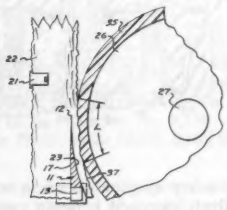


Apparatus for simultaneously removing slab material and cutting a board from a log in a lumber mill. As each log is moved on a sawmill carriage towards a head saw, slab or side material thereof is removed by a chipper head in the form of chips, thereby providing the log with a face parallel to the cutting plane of the saw. The speed of rotation of the chipper head is changed instantly when the carriage speed changes in order to produce chips having predetermined fiber length regardless of the usual variations in carriage speed.

3,612,120
WOOD SLICER

George Knap, 4408 Wildwood Crescent, South Burnaby, Canada

Filed Oct. 13, 1969, Ser. No. 865,813
Int. Cl. B27l *5/06*
U.S. Cl. 144—178 **3 Claims**

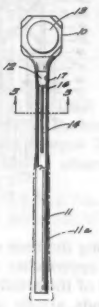


A log slicer having a knife arranged to pass longitudinally through a log so as to cut a slice therefrom. A roller is positioned adjacent to the knife to exert pressure on the log and slice extending over a length thereof in advance of and behind the cutting edge of the knife.

3,612,121
IMPACT TOOL

Ernest O. Estwing, Rockford, Ill., assignor to Estwing Manufacturing Company, Inc., Rockford, Ill.

Filed Apr. 23, 1970, Ser. No. 33,008
Int. Cl. B25d *1/00;* **B25g** *3/34*
U.S. Cl. 145—29 R **9 Claims**

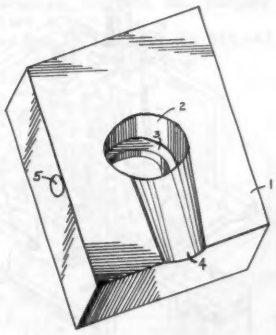


The tool has a head with a tang to which is brazed a tubular steel handle. The handle is generally elliptical in cross section, and a reinforcing rib is located adjacent the head and lies in the plane of the major axis of the handle ellipse. The reinforcing rib is secured both to the tang and to the inside of the tubular steel handle.

3,612,122
EGG OPENER

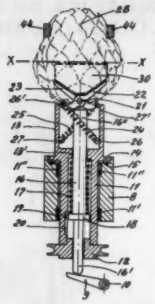
Richard C. Bjork, 934 Vernal Ave., Mill Valley, Calif.

Filed Aug. 6, 1969, Ser. No. 847,926
Int. Cl. A47j *43/14*
U.S. Cl. 146—2 B **5 Claims**



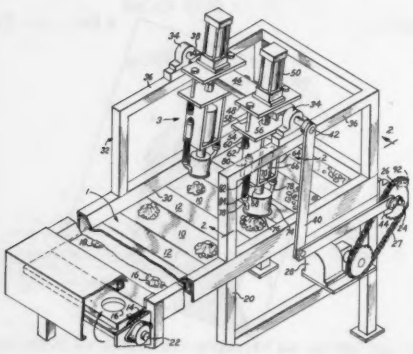
A device for opening an uncooked liquid egg, a soft-boiled egg, or a hard-boiled egg. The egg is placed into a cavity in the egg holder. Then a knife blade is thrust into the shell to start a break. The knife blade is then rotated to force the break open so that the albumen and yolk may be readily removed. A trough is provided on the egg holder to facilitate the pouring out of the albumen and yolk of an uncooked egg. The knife blade is then removed.

3,612,123
SHAPING ARTICHOKE HEARTS
Giordano Tomelleri, 22 Via Montorio, Verona, Italy
Filed June 2, 1969, Ser. No. 829,253
Claims priority, application Italy, June 5, 1968, 61,258/68
Int. Cl. A23n *15/00*
U.S. Cl. 146—52 3 Claims



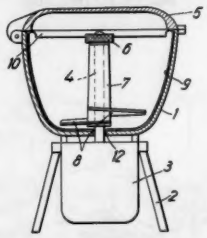
Apparatus for shaping the base of an artichoke heart comprises a knife which approaches the base of the artichoke along the median axis of the artichoke and rotates about this axis. The knife extends axially until it penetrates the artichoke base but once it has penetrated the artichoke base its inclination with respect to the axis is progressively increased as it advances so that a conical shape is formed which diverges towards the tip of the artichoke. The outer portion of the lower part and top of the artichoke are subsequently removed.

3,612,124
FOOD-CORING APPARATUS
Eugene H. Cunningham, deceased, Watsonville, Calif. (by Ruby Cunningham, administratrix); Robert L. Guinn, Bloomington, Minn., and Edward G. Langill, Aptos, Calif., assignors to Green Giant Company
Filed June 12, 1969, Ser. No. 833,248
Int. Cl. A23n *3/12*
U.S. Cl. 146—52 16 Claims



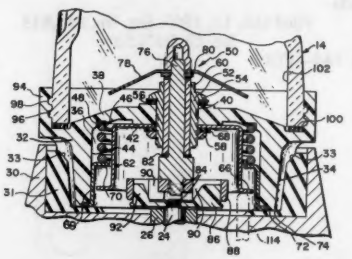
Food-coring apparatus for use in the coring of foods, such as cauliflower, includes a movable flight conveyor having food-holding pockets therein and an air piston operated retractable head having an air-powered coring bit and a cover which is rapidly moved into coring position by the air piston. An actuating eccentric is mounted on the conveyor drive for actuating air to the piston and bit to move the retractable head toward the food to engage the food with the cover and coring bit. The depth to which the food is cored is controlled independently of the position of the conveyor flights by a switch responsive to the movement of the retractable head to retract the bit and cover and secure the air to the coring bit.

3,612,125
CUTTING DEVICE
Helmut Krauth, Union, N.J., assignor to Unimaco, Inc., Manhasset, N.Y.
Filed Oct. 4, 1968, Ser. No. 765,170
Claims priority, application Germany, Oct. 18, 1967, ST 27474 X/346
Int. Cl. B02c *18/12*
U.S. Cl. 146—68 9 Claims



An outer receptacle has removably nested therewithin an inner receptacle, at least a portion of the peripheral wall of which is apertured. A rotatable shaft extends through the bottom wall of the outer receptacle into the interior of the inner receptacle. A hub assembly surrounds that portion of the shaft which is located in the inner receptacle and carries transversely extending cutter blades. Connecting means releasably connects the hub assembly to this portion of the shaft to enable simultaneous withdrawal of the hub assembly and the inner receptacle from the outer receptacle.

3,612,126
LIQUIDIZER SAFETY CLUTCH
Robert J. Emmons, Manchester, and Maurice P. Samuelian, West Hartford, both of Conn., assignors to Dynamics Corporation of America, New York, N.Y.
Filed Aug. 14, 1969, Ser. No. 850,182
Int. Cl. B02c *18/12*; A47j *43/042*
U.S. Cl. 146—68 A 14 Claims

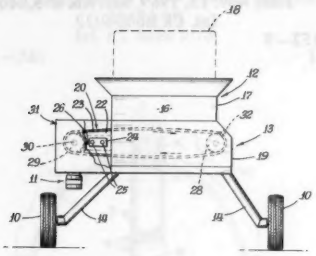


Liquidizer safety ejection clutch in which a resilient element operatively disposed between two axially engageable clutch elements yields under the combined weight of a jar and base of a two-piece container placed in working position to permit the clutch members to engage yet holds the clutch elements apart under the weight of the base alone to prevent operation of the exposed cutters when the jar is absent from the base.

3,612,127
HAY BALE CUTTER

Edward L. Benno, Route 1, Box 198, Grayslake, Ill.

Filed Nov. 26, 1969, Ser. No. 880,204
Int. Cl. A01f *29/00*
U.S. Cl. 146—70.1 **6 Claims**

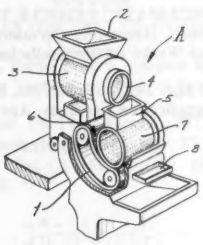


A hay bale cutter comprising a generally rectangular housing open at opposite ends with a plurality of linear cutters supported exteriorly of the housing and extending through slots in the housing and across the opening through the housing.

3,612,128
FOOD-PROCESSING BELT

Nicholas Robert Beck, University City, Mo., and Shinji Kurihara, Fukuyama, Japan, assignors to Bibun Machine Construction Company Ltd., Fukuyama, Hiroshima Prefecture, Japan, by said Beck

Filed Dec. 11, 1969, Ser. No. 884,073
Int. Cl. A22c *17/00*
U.S. Cl. 146—76 **4 Claims**



In an apparatus for separating meat from animal bone, a resilient belt, preferably molded from a solid polyurethane elastomer, is constructed having beveled edges which extend into contiguity with the surface of a perforated revolving drum so as to accommodate a quantity of crushed meat-bearing material into compressibility with said drum; and, the surface of the belt in communication with the drum is knurled or ridged to insure retention of said material compressed against the drum.

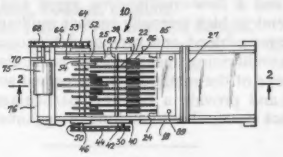
3,612,129
BARBECUED MEAT-CUTTING MACHINE

Joseph T. Scarborough, Route 1, Box 36, Uniontown, Ala., and Bob Wade, Route 1, Box 271, Marion, Ala.

Filed Feb. 6, 1970, Ser. No. 9,190
Int. Cl. A22c *17/00;* **B02c** *18/06;* **B26d** *9/00*
U.S. Cl. 146—78 R **10 Claims**

A machine for slicing and chipping barbecued meat has a framework supporting a plurality of spaced, vertical rotating circular blades on a rotating horizontal shaft to cut the meat into slices.

Another rotating shaft supports a plurality of straight, sharp chipper blades which rotate between the circular blades to cut the slices into chips and to keep the circular blades clear of cut meat. A slotted guide blade under the circular blades guides the meat to the circular blades for cutting and removes pieces of meat sticking to edges of the circular

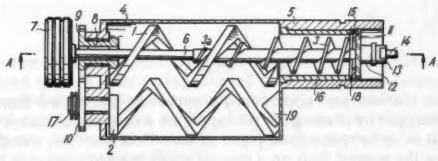


blades. A drive motor is connected by a chain drive to the shafts to rotate the circular blades and chipper blades in opposite directions simultaneously.

3,612,130
MEAT GRINDER

Pan Ponka, Cernosice, and Vaclav Pachovsky, Prague, both of Czechoslovakia, assignors to Chepos Zavody chemickeho a potravinarskeho strojirenstvi, oborovy podnik, Brno, Czechoslovakia

Filed Jan. 27, 1969, Ser. No. 794,181
Int. Cl. B02c *18/30*
U.S. Cl. 146—181 **8 Claims**

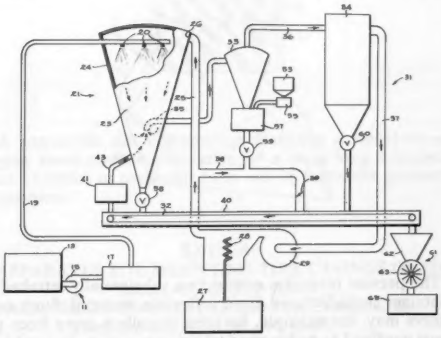


A meat grinder whose hopper is equipped with two Z-type kneading and mixing blades. One of these blades coaxially envelops an integral portion of the feed screw which projects from the cutter housing into the hopper and pushes meat from the hopper into the housing and to the cutters at the front end of the housing.

3,612,131
METHOD AND APPARATUS FOR MANUFACTURE OF PARTICULATE FATTY MATERIALS

Russell W. Carnahan, Deerfield, Ill., assignor to Kraftco Corp., New York, N.Y.

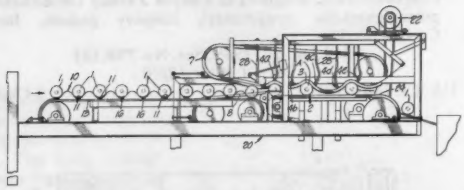
Filed Dec. 19, 1969, Ser. No. 886,443
Int. Cl. A23p *1/00*
U.S. Cl. 146—228 **7 Claims**



A method and apparatus for providing a flowable particulate product from a fatty material having a melting point

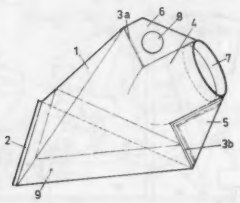
above ambient temperature is provided. The method includes the steps of establishing the fatty material in a melted state, spray chilling the melted fatty material to provide the particulate fatty material, providing a coarse blend of the fatty material and a flow-conditioning agent and subjecting the coarse blend to high-intensity impact mulling so as to texturize the coarse blend and provide a homogeneous blend of the flow-conditioning agent and the particulate fatty material. The steps of the method are performed substantially continuously and provide a flowable particulate fatty material which is not susceptible to melting or agglomerizing.

3,612,132
METHOD AND APPARATUS FOR DECROWNING PINEAPPLES
Masato Tsutsumi, Kahului, Hawaii, assignor to Maui Land & Pineapple Company, Inc., Kahului, Maui, Hawaii
Filed Dec. 29, 1969, Ser. No. 888,532
Int. Cl. A23n *15/04*
U.S. Cl. 146—237 **8 Claims**



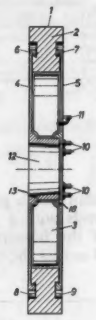
A method and apparatus for removing the crown from a pineapple by placing the pineapple on a convoluted conveyor belt so as to space each piece of fruit from another, transferring the spaced fruit on a second softly matted conveyor belt traveling in the same direction as the convoluted belt, bringing the top portion of the fruit into contact with a third soft weighted matted member suspended directly above the second matted conveyor belt. This top matted member imparts a spin or twist to the fruit in a direction opposite to their direction of travel. A pair of conveyors running parallel to the second conveyor to receive the crown and stop its rotation while the fruit is still rotating thus twisting the crown off from the fruit.

3,612,133
FOLDABLE CONTAINER PROVIDED WITH AN OPENING, AND METHOD AND MEANS FOR ITS MANUFACTURE
Olle Jarund, Otto Lindbladsvagen 18, Lund, Sweden
Filed Mar. 11, 1969, Ser. No. 806,069
Claims priority, application Sweden, Mar. 20, 1968, 3655/68
Int. Cl. B65d *33/16*
U.S. Cl. 150—0.5 **4 Claims**



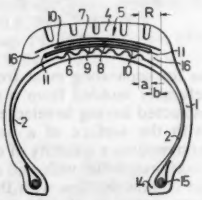
The present invention relates to a substantially tetrahedral container manufactured from a flexible material. Such containers may, for example, be used to collect urine from patients confined to bed instead of the conventionally used bottles of glass. Such a container can easily be folded flat during storage before its use and thereafter, when it is to be used, can easily be positioned and stabilized by the weight of the contents on the bottom of the container, whereby the inlet opening of the container is positioned about the liquid level in the container.

3,612,134
ROLLER WHEEL
Franz Mlnarik, 18, Leniengasse, Vienna, 6, Austria
Filed Nov. 12, 1969, Ser. No. 875,840
Int. Cl. B60b *9/22*
U.S. Cl. 152—9 **2 Claims**



A roller wheel which comprises a wheel hub, a tread ring, which is radially movable relative to the wheel hub, a pneumatic tire, which is disposed between said tread ring and said wheel hub, and two discs, which cover the sides of the roller wheel and one of which is integral with the wheel hub.

3,612,135
PNEUMATIC VEHICLE TIRE
Hermann Wittneben, Hannover, Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany
Filed Apr. 21, 1969, Ser. No. 817,663
Claims priority, application Germany, Apr. 25, 1968, P 17 55 316.1
Int. Cl. B60c *9/14*
U.S. Cl. 152—361 **8 Claims**



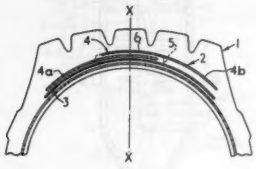
A pneumatic vehicle tire with bead cores and a tread strip and cord fabric layers with pull-resistant thread means located in the sidewalls of the tire and extending approximately at a right angle to the circumferential direction of the tire while being anchored to said bead cores, in which beadlike tread strip reinforcing means are arranged radially inwardly of the tread strip and extend approximately over the width of the tread strip, said tread strip reinforcing means comprising a cord fabric layer folded so as to have a flat S-shaped cross section, the end leg portions of which, are shorter than the leg portions therebetween while an additional cord fabric layer forming part of said tread strip reinforcing means is interposed between the folded cord fabric layer and the tread strip and has its marginal areas protrude beyond said folded cord fabric layer in the direction toward the tire sidewalls.

3,612,136

PNEUMATIC TIRES

Vernon E. Gough, Croyde, near Braunton, North Devon, England, assignor to Dunlop Holdings Limited, London, England

Filed June 9, 1969, Ser. No. 831,434
Claims priority, application Great Britain, June 20, 1968, 29423/68
Int. Cl. B60c 9/18
U.S. Cl. 152—361 18 Claims



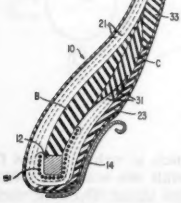
A pneumatic tire provided with a breaker assembly of at least one composite breaker layer, each composite breaker layer comprising at least two narrow breaker layers of cord fabric, the cords of each narrow breaker being substantially rectilinear, the narrow breaker layers each being substantially narrower than the total tread width and being arranged in radially spaced apart and partially overlapping relationship, a layer of rubber or rubberlike material being interposed between the overlapping portions thereof, the overall axial extent of each composite breaker layer being substantially equal to the total tread width.

3,612,137

LARGE SIZE TIRES FOR TRUCKS AND OTHER HEAVY VEHICLES

Raymond J. Guyot, Paris, France, assignor to CTA-Compagnie Industrielle de Textiles Artificiels et Synthetiques, Paris, France

Filed Nov. 19, 1968, Ser. No. 777,119
Claims priority, application France, Nov. 27, 1967, 129,815
Int. Cl. B60c 15/06
U.S. Cl. 152—362 R 6 Claims



A large size tire particularly adapted for trucks and other heavy vehicles, the tire being one that is reinforced by a radial or standard casing of cords turned in the bead in open plies around a single wire, the tire being one in which the turned-back portion of the cords follows a direction substantially parallel to that of the traction cords opposite thereto, the bead being stiffened above the wire to the level of the rim by a core of rubber having a shore hardness greater than 80, said core being covered with a further rubber core having a shore hardness in the order of 55 to 60.

Generally, the length of the turned-back portion of the cords forming the open ply is as slight as possible, the end of the turned-back cords being turned slightly outward.

3,612,138

TIRE BEAD TURNUP EXTENSION

Arthur S. Ravenhall, Solihull, England, assignor to Dunlop Holdings Limited, London, England

Filed July 8, 1969, Ser. No. 839,863
Claims priority, application Great Britain, July 23, 1968, 35078/68
Int. Cl. B60c 15/06
U.S. Cl. 152—362 R 14 Claims

A tire with a carcass having a ply or plies turned up around a bead wire. A reinforcing strip of rubberized cord fabric is provided overlapping the turnup and forming a radially outward extension of the turnup. The cords in the reinforcing strip are disposed at the same angle as the cords in the carcass ply, but are more flexible.

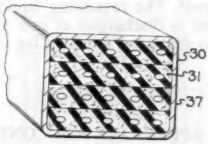
The invention is particularly applicable to radial ply tires having metal cord reinforcements.

3,612,139

NOVEL BEAD STRUCTURE FOR PNEUMATIC TIRES

Alfred Marzocchi, Cumberland, and Alfred Winsor Brown, Woonsocket, both of R.I., assignors to Owens-Corning Fiberglas Corporation

Filed Aug. 13, 1969, Ser. No. 849,669
Int. Cl. B60c 15/04
U.S. Cl. 152—362 5 Claims



A pneumatic tire construction featuring a wheel-rim-engaging bead structure inclusive of a bead ring containing glass elements of particular form and in particular geometric disposition.

3,612,140

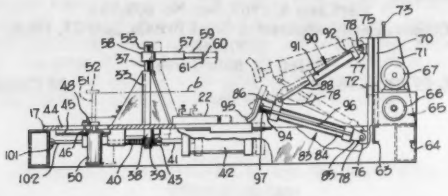
APPARATUS FOR MOUNTING TIRE CASINGS ONTO DUAL-FLANGED RIMS

Sylvester William Malinski, P.O. Box 161, Tamaroa, Ill.

Filed Jan. 28, 1970, Ser. No. 6,469
Int. Cl. B60c 25/06
U.S. Cl. 157—1.17 3 Claims

For mounting large tire casings on tractors and other off-highway vehicles, this apparatus is of the type having a linear actuator whose shoe presses slantingly against the tread of a

tire casing, to drive a portion of a sidewall bead against the drop center of the rim; then presses further to shift the



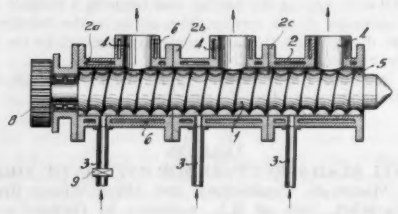
sidewall to the other side of center, permitting the remainder of its bead to be deflected over the rim.

3,612,141

METHOD OF AND DEVICE FOR CONTINUOUSLY EXTRACTING A LIQUID COMPONENT CONTAINED IN A LIQUID

Herbert Ocker, Leonberg, Germany, assignor to Werner & Pfleiderer, Stuttgart-Feuerbach, Germany

Filed Feb. 10, 1969, Ser. No. 798,197
Claims priority, application Germany, Feb. 15, 1968, P 17 19 453.5
Int. Cl. B01d *1/28*
U.S. Cl. 159—2 E **6 Claims**



A volatile liquid component contained in a liquid is continuously extracted therefrom by volatilizing the component while the liquid is forced to flow through an elongate container. The liquid to be purified is fed into the container at lengthwise spaced points thereof and the volatilized component is removed from the container through ports at intermediate points thereof. The remaining liquid now liberated from the component is discharged at one end of the container. There is also disclosed a device for carrying out the method.

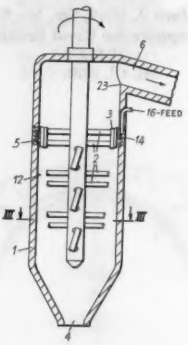
3,612,142

PROCESS AND APPARATUS FOR CONTINUOUSLY POLYCONDENSING OR POLYMERIZING MONOMERS

Federico Urgesi, Vercelli, Italy, and Horst Rothert, Berlin, Germany, assignors to Chatillon Societa Anonima Italiana per le Fibere Tessili Artificial S.p.A., Milan, Italy and Karl Fischer Apparate-u. Rohrleitungsbau, Berlin (Borsigwalde), Germany

Division of Ser. No. 519,836, Jan. 11, 1966, abandoned
Filed June 26, 1969, Ser. No. 850,293
Int. Cl. B01d *1/22*
U.S. Cl. 159—6 W **5 Claims**

There is provided apparatus particularly useful in the conduct of polymerization or polycondensation of a viscous monomer composition, which apparatus is characterized by means for continuously feeding a stream of material toward a peripheral-receiving zone of a surface and rotary means for spreading the material within said receiving zone on the surface in a thin layer to move on the surface toward a discharge zone thereof spaced from the receiving zone. In more specific embodiments, means are also provided for continuously heating the layer while it is on the surface. Means for continuously removing vapors issuing from the layer are



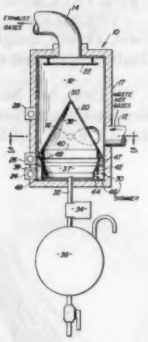
also provided. Discharge means for removing the layer from the surface in the discharge zone are also provided.

3,612,143

APPARATUS FOR LIQUID WASTE DISPOSAL

Aaron J. Ungerer, Lakewood, Ohio, assignor to The Standard Products Company, Cleveland, Ohio

Filed Nov. 3, 1969, Ser. No. 873,229
Int. Cl. B01d *1/22*, *1/14*
U.S. Cl. 159—16 **6 Claims**



Heated gases, such as exhaust gases from an engine, and liquid waste materials are mixed in a container with the hot gases vaporizing the liquid. Cyclonic movement of the gases separates unvaporized liquid droplets from the gas and prevents escape of any liquid from the container. The mixed vapors and gases leave the container through a common outlet. The container may also include means for condensing and separating pollutants such as oil from the gases.

3,612,144

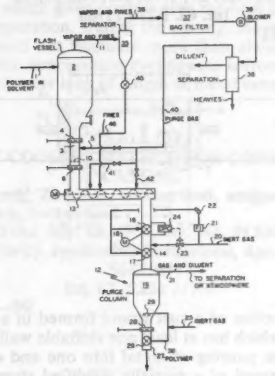
RECOVERY OF POLYMER FINES BY SPRAY DRYING

Roy B. Marcum, and George K. Chandler, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Jan. 23, 1969, Ser. No. 793,511
U.S. Cl. 159—48 **7 Claims**

A polymer diluent mixture is flashed. Polymer containing residual diluent is conveyed to a location remote from the flashing zone where the residual diluent is purged. Vaporous

diluent containing polymer fines taken overhead from the flashing zone is separated into a purified diluent stream and a

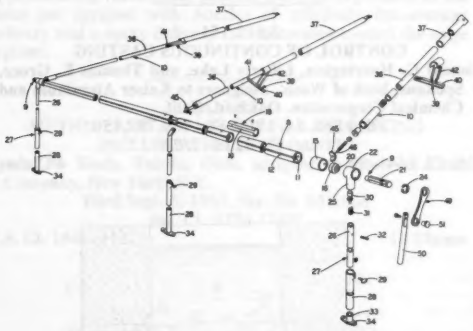


polymer fines stream, the latter being admixed with the polymer leaving the flashing zone.

3,612,145
ROLLUP AWNING

Andrew J. Darula, Lakewood, and John D. Knight, Mantua, both of Ohio, assignors to The Astrup Company, Cleveland, Ohio

Filed Jan. 9, 1970, Ser. No. 1,817
Int. Cl. E04f *10/06*
U.S. Cl. 160—67 **16 Claims**

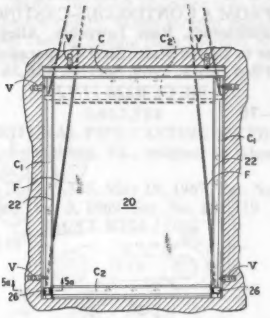


A fabric rollup awning for use on travel trailers, mobile homes, residential patios and terraces, and commercial and industrial applications for quick shade from the sun. A pocket at the upper edge of the fabric molding contains a ¼-inch nylon cord which is slid through the conventional trailer molding attached to the sidewall of the structure. A front bar roller has a spherical groove which slidably receives a nylon cord located in a pocket attached to the front portion of the fabric awning. Two-piece telescoping spring-loaded rafters extend from the upper end of the fabric awning to the front bar roller and support the same; and uprights are pivotally attached to the ends of the roller and support the same either from the sidewall of the trailer or building or from the ground. Roller end assemblies upon the front bar roller incorporate spring-loaded hexagonal trunnions and ratchet means is associated therewith for rolling the front bar roller up or down.

3,612,146
WINDOW-COVERING SUPPORT ASSEMBLY

Alfred Klein, Parc Notre-Dame; Vallauris, France

Continuation-in-part of application Ser. No. 710,891, Mar. 6, 1968, now abandoned. This application Aug. 8, 1969, Ser. No. 856,077
Int. Cl. E06b *9/52*
U.S. Cl. 160—273 **1 Claim**



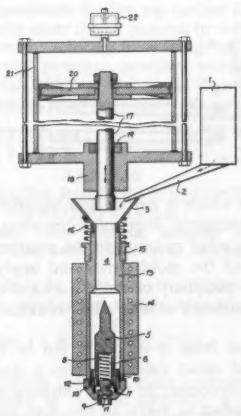
A support assembly for holding a window covering, such as a curtain, insect screening, and the like, is composed of individual stationary frame sections which are secured to the window frame and a movable frame section which slides relative to the stationary frame sections. Hook means are slidably engaged in the frame sections and secure the window covering to the frame so that it may be moved between a fully opened and a fully closed position. The frame is arranged so that in the assembled position the hooks cannot be removed from the frame sections. the Geneva wheel.

A pair of rotatable perforating knives positioned 180° apart is positioned adjacent the feed drum and rotate into contact with the paper around the drum at the appropriate positions thereof by being driven by the Geneva wheel to perforate the paper at long or short intervals as necessary.

3,612,147
METHOD OF MAKING WAX CASTINGS

Morton S. Kaplan, Hibiscus Island, Miami, Fla., assignor to Waltech Corporation, Miami, Fla.

Filed Oct. 8, 1968, Ser. No. 765,804
Int. Cl. B22c *7/02*
U.S. Cl. 164—45 **5 Claims**



This disclosure is directed to a process and apparatus for making wax castings for use in the lost wax process of mak-

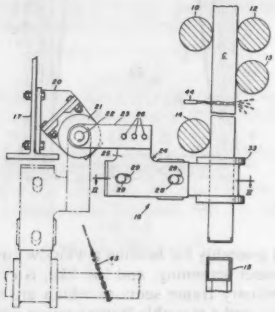
ing articles of jewelry. The process involves injection molding a powdered wax which is heated to a temperature under its melting point. The powdered was may be made by grinding prefrozen wax. The apparatus includes an injection ram which is operated under a high-pressure and a slow-ram cycle.

3,612,148

METHOD AND APPARATUS FOR REMOVING ABORTED CASTINGS FROM A CONTINUOUS-CASTING MACHINE

Glenn A. Waldschmidt, Ross Township, Allegheny County, Pa., assignor to United States Steel Corporation

Filed July 2, 1969, Ser. No. 838,561
Int. Cl. B22d *11/12*
U.S. Cl. 164—70 **6 Claims**



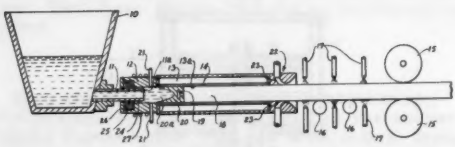
In operating a continuous-casting machine sometimes there is left in the machine a length of casting too short to be handled by the driven rolls of the machine. Such castings are referred to as "aborted." The invention is an apparatus for gripping an aborted casting below the pinch rolls of the casting machine. The casting is severed with a torch, after which the apparatus swings the severed length out of the way. The steps are repeated until the entire casting is removed.

3,612,149

CONTINUOUS CASTING METHOD

Irving Rossi, Morristown, N.J., assignor to Concast Incorporated, New York, N.Y.

Filed Sept. 5, 1968, Ser. No. 757,558
Int. Cl. B22d *11/00*
U.S. Cl. 164—73 **2 Claims**



In apparatus which is particularly adapted for continuous casting in a horizontal direction lubrication is provided by feeding a lubricating material to the peripheral edge of the entrance end of the mold cavity and applying a pulsating vacuum at the periphery of the exit end of the mold cavity. Structure producing a venturi effect is utilized for producing the vacuum.

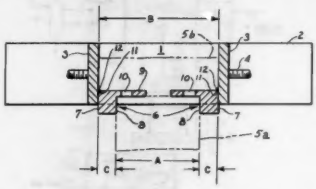
Molten metal from a supply is fed to the mold cavity through a feed spout extending into a duct of refractory material which is connected to the entrance of the mold cavity. Heat is applied to metal in the duct for melting metal which has solidified on the end of the feed spout and for keeping the metal molten in the duct. The high heat required is suitably applied by induction heating coils around the duct.

3,612,150

METHOD OF CHANGING THE CROSS SECTION OF CONTINUOUS CASTINGS

Irving Rossi, Morristown, N.J., assignor to Concast Incorporated, New York, N.Y.

Filed Apr. 27, 1970, Ser. No. 31,932
Int. Cl. B22d *11/08*
U.S. Cl. 164—82 **3 Claims**



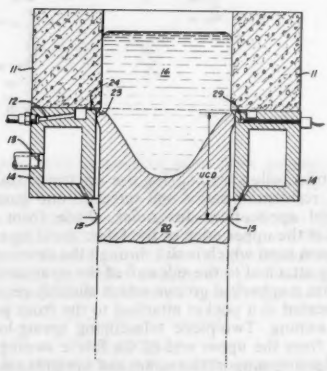
The cross section of a cast strand formed in a continuous casting mold, which has at least one shiftable wall, is changed by stopping the pouring of metal into one end of the mold and the withdrawal of a partially solidified strand from the other and allowing the strand and end portion remaining in the mold to cool enough to be self-supporting. An insert having its upper portion corresponding to the new cross-sectional area desired for the strand, and having its bottom portion conforming to the area of the original strand, is placed on the aforesaid strand end portion. If the new cross section is to be larger, the shiftable mold wall, or walls, are moved outward to receive an appropriate insert and to correspond to the new size defined by the upper portion of the insert. If the new cross section is to be smaller, an appropriate insert is placed on the strand end portion in the mold and sufficient metal is poured into the mold to partially fill the interior of the insert; then, when this additional metal has solidified enough to be self-supporting the strand is withdrawn slightly from mold and the shiftable wall, or walls, are moved inward against the upper portion of the insert to define the new strand size.

3,612,151

CONTROL OF CONTINUOUS CASTING

Donald G. Harrington, Liberty Lake, and Thomas E. Groce, Spokane, both of Wash., assignors to Kaiser Aluminum and Chemical Corporation, Oakland, Calif.

Filed Feb. 14, 1969, Ser. No. 799,450
Int. Cl. B22d *11/02*
U.S. Cl. 164—89 **4 Claims**



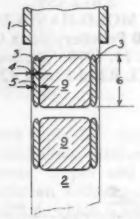
A method for metal casting in a direct-chill continuous mold having an insulated feed reservoir. The feed reservoir is axially aligned with the mold and has an overhang over the mold face of not more than one-eighth inch. The casting

speed for the metal is established so that the upstream conduction distance which is measured from the liquid wetting line of the chill liquid on the ingot surface extends to within about 1 inch of the reservoir. The casting speed and upstream conduction distance are controlled to satisfy a critical relationship which gives control over the heat transfer during the casting operation. During the casting, the mold wall temperature should not fluctuate more than about ±25° F. per cycle when the temperature cycling rate is from about 0.5 to about 10 cycles per inch of length of metal being cast.

3,612,152
BILLET COOLING METHOD FOR CONTINUOUS CASTING

Peter J. Koenig, Zumikon, Switzerland, assignor to Concast A.G., Zurich, Switzerland

Filed Apr. 20, 1970, Ser. No. 29,834
Claims priority, application Switzerland, Apr. 15, 1969, 5647/69
Int. Cl. B22d *11/00*
U.S. Cl. 164—89 **5 Claims**

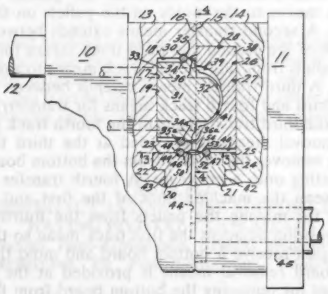


In a method of cooling continuously cast billets of polygonal cross section the surfaces of the casting are sprayed with coolant from atomizing nozzles as it leaves the mold. The sides adjacent the edges are sprayed by nozzles having a relatively high-average delivery per unit area in an approximately rectangular pattern; the central portions of the sides are sprayed with nozzles of relatively low-average delivery and a spray delivery that decreases toward the edge regions.

3,612,153
METHOD AND APPARATUS FOR DIECASTING INCLUDING A FLASH CAVITY

Byron W. Koch, Toledo, Ohio, assignor to National Lead Company, New York, N.Y.

Filed Sept. 5, 1969, Ser. No. 855,638
Int. Cl. B22d *17/00*
U.S. Cl. 164—113 **10 Claims**

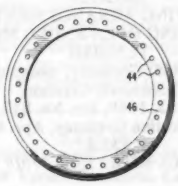


The present invention is a diecasting method and apparatus. The apparatus includes a dieholder having an opening defined in one surface. A recess portion is provided in the sidewall of the dieholder opening. A die block is removably positioned in the dieholder opening. The die block surface is complementary with the sidewall recess portion for forming a flash stop. In one embodiment, the dieholder defines a shoulder and the die block has a complementary flange. In another embodiment, the die block and dieholder define complementary openings which receive a separable flash stop member. In both embodiments, a flash groove or chamber is located adjacent the flash stop and is in communication with the die casting cavity. The flash chamber is in liquid communication with the die cavity. When molten metal solidifies it forms an integral casting having flash thereon of a predetermined configuration.

3,612,154
CENTRIFUGAL PIPE CASTING METHOD

Jean Denyszyn, Lynchburg, Va., assignor to Glamorgan Pipe & Foundry Co.

Division of Ser. No. 639,535, May 18, 1967, Pat. No. 3,499,479.
Filed Dec. 3, 1969, Ser. No. 881,719
Int. Cl. B22d *13/02*
U.S. Cl. 164—114 **2 Claims**



Centrifugal pipe-casting method utilizing a rotatable mold and a permanent-type reusable core for partially closing the mold at its pipe withdrawal end. The portion of the core-facing casting material within the mold presents a surface with indentions for receiving and solidifying casting material so as to hold the end of the pipe and prevent distortion and end-cracking prior to removal of the pipe from the mold.

3,612,155
ANTIPIPING COMPOUND AND PROCESS FOR THE HEAT RETAINING OF HOT TOP SURFACE

Shigeru Matsuyama, Utsunomiya, and Yukio Ito, Imaichi, both of Japan, assignors to Aikoh Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1970, Ser. No. 89,455
Claims priority, application Japan, July 3, 1970, 45/57719
Int. Cl. B22d *7/10, 27/04*
U.S. Cl. 164—123 **2 Claims**

An antipiping compound for hot top surface for ingot making which essentially more than 5 percent by weight of coffee grounds in components selected from the group consisting of easily oxidized metal powders, powdery metal oxides, carbonaceous materials, fibrous materials, fluorides, nitrates, nonporous and porous refractory materials and other effective materials.

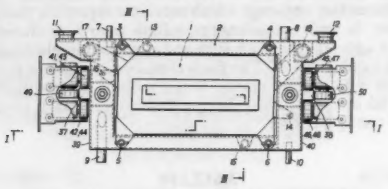
3,612,156
PLAY-FREE GUIDE ROLLERS FOR CONTINUOUS CASTING MOULD

Rudolf Schoffmann, Linz, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed May 21, 1970, Ser. No. 39,456
Claims priority, application Austria, May 30, 1969, A 5142/69
Int. Cl. B22d *11/02, 27/08*
U.S. Cl. 164—260 **5 Claims**

A continuous casting plant for slabs comprising a lifting table to be oscillated in vertical direction, a water-cooled casting mould releasably connected to said lifting table, and a short, vertical bar guiding means arranged below said casting mould, wherein said lifting table is designed as a rectangular, closed, water-cooled, box-type frame having two vertical

ledges arranged on its two narrow sides, said ledges engaging with guiding means supported on the pouring platform and adjustable to be exactly vertical. By this guiding mechanism



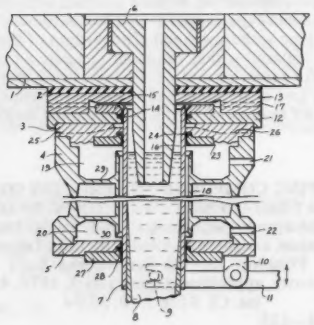
any displacements between the casting mould and the bar guiding means are safely eliminated and cracks in the bar are avoided.

3,612,157

CONTINUOUS-CASTING ARRANGEMENT COMPRISING A RECIPROCATING OPEN-ENDED MOLD AND A TUNDISH

Klaus Brock, Dusseldorf, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed Apr. 3, 1969, Ser. No. 812,993
Claims priority, application Germany, Apr. 8, 1968, P 17 58 133.8
Int. Cl. B22d *11/00, 27/08*
U.S. Cl. 164—260 **3 Claims**



A continuous-casting arrangement comprises open-ended mold and a tundish disposed above it wherein the space between molten metal in the mold and the tundish is sealed for the purpose of pressure regulation. The invention is characterized by the fact that the mold consists of a stationary outer part that is fixed to the tundish and of an inner part facing metal in the mold with a sliding seal interposed between the inner and outer mold parts, there being means connected for oscillating the inner part within the outer part.

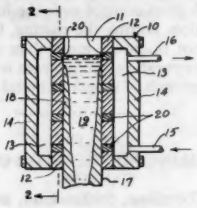
3,612,158

CONTINUOUS CASTING MOLD HAVING MULTIPLE INSERTS THROUGH THE CASTING SURFACE WALL

Irving Rossi, Morristown, N.J., assignor to Concast Incorporated, New York, N.Y.

Filed Oct. 29, 1968, Ser. No. 771,592
Int. Cl. B22d *11/00*
U.S. Cl. 164—283 **1 Claim**

In a continuous-casting mold the wall defining an open-ended mold cavity has inserts therethrough at spaced intervals. The inserts are made of a material, such as copper, having high heat conductivity while the wall is made of a material, such as steel, which has lower heat conductivity. The ends of the inserts are exposed respectively at the casting surface



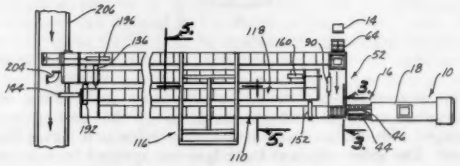
of the mold cavity and in a conduit through which a coolant is circulated in contact with the wall.

3,612,159

AUTOMATIC MOLD-HANDLING SYSTEM

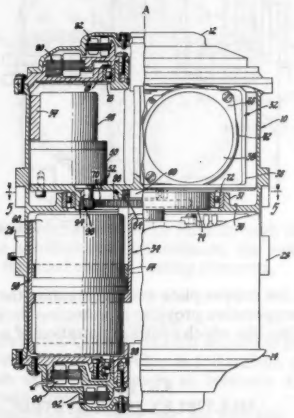
Milton L. Galinsky, 400 Pelletier, Sioux City, Iowa

Filed Feb. 11, 1970, Ser. No. 10,504
Int. Cl. B22d *33/00, 42/02*
U.S. Cl. 164—324 **15 Claims**



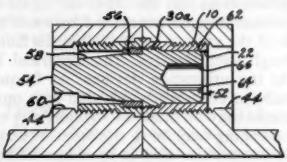
A mold-handling conveyor system for use with an automatic match plate molding machine adapted to produce sand molds on a perforated bottom board. First, second, third and fourth track mean are laterally positioned with respect to each other with one end of the first track means positioned adjacent the molding machine. Movable pallets are mounted on the track means in an end-to-end relationship. Means is provided at the machine end of the first track means for receiving the bottom board and mold thereon. A first transfer means extends between the far ends of the first and second track means for transferring the pallets from said first track means onto said second track means. The weights and jackets are shifted from the molds on the pallets on the second track means to the molds on the pallets on the first track means. A second transfer means extends between the machine ends of the second and third track means for transferring the pallets from said second track means to said third track means. A third transfer means extends between the far ends of the third and fourth track means for transferring the pallets from the third track means to the fourth track means. A casting removal means is provided at the third transfer means which removes the casting from the bottom board and drops the casting onto a conveyor. A fourth transfer means extends between the machine ends of the first and fourth track means for moving the pallets from the fourth track means into position adjacent the first track mean so that the pallet may again receive a bottom board and mold thereon. A bottom board removal means is provided at the fourth transfer means for removing the bottom board from the pallet as it is being moved to the position adjacent the machine end of the first track means. Power means are provided for operating the various transfer means. A control means is connected to the power means for coordinating the movement of the pallets with respect to the operation of the molding machine.

3,612,160
INERTIAL REFERENCE APPARATUS
William W. Burroughs, Jr., Manchester, Mass., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 15, 1968, Ser. No. 752,907
Int. Cl. G01c *19/08*
U.S. Cl. 74—5.34 6 Claims



An inertial reference unit for navigation and control systems comprising gimballed platforms carrying inertial measurement instruments. Upper and lower platforms are disposed in stacked relation within a cylindrical inner roll gimbal. The upper platform, which is rotatable relative to the gimbal is stabilized in azimuth by a closed-loop torque system. The lower platform depends from the upper platform and is rotated relative thereto at a uniform angular rate.

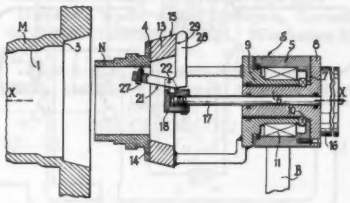
3,612,161
GUIDE PIN AND BUSHING ASSEMBLY FOR FLASK, PATTERNS, AND THE LIKE
Gerald R. Rusk, Maumee, Ohio, and Robert E. Koch, Ottawa Lake, Mich., assignors to The Freeman Supply Company, Toledo, Ohio
Filed Sept. 15, 1969, Ser. No. 857,819
Int. Cl. B22c *21/10*
U.S. Cl. 164—385 3 Claims



A two-part bushing or guide pin for aligning foundry flasks, hotboxes, and the like comprising: a machinable body portion having external threads for threading into a flask, hotbox, etc., and internal threads for receiving either a hardened nonmachinable guide ring or a hardened nonmachinable guide pin.

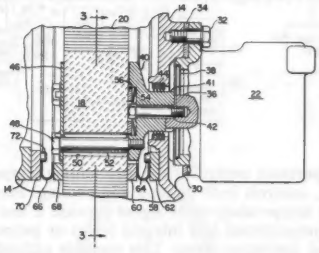
3,612,162
CENTRIFUGAL CASTING CORE SUPPORT DEVICE HAVING PIVOTAL CLAW MEANS
Michel Pierrel, Pont-A-Mousson, France, assignor to Centre De Recherches De Pont-A-Mousson, Pont-A-Mousson, France
Filed July 2, 1970, Ser. No. 51,859
Claims priority, application France, July 3, 1969, 6922530
Int. Cl. B22c *13/10*
U.S. Cl. 164—397 5 Claims

Core support device for a centrifugal pipe-casting machine. The device comprises a housing having a nonrotating part and a rotating part which is connected to a support ring through at least one branch. The nonrotating part carries a piston-and-cylinder fluid motor whose piston rod extends through the nonrotating part of the housing and carries at



one end a core-seizing device which is capable of engaging the inner face of the core and is rotatable on the piston rod. The core-seizing device comprises spring-biased pivotal claws which are pivoted to the core-engaging position by abutment of heel portions of the claws against the support ring.

3,612,163
SUPPORT AND DRIVE MEANS
Louis Powell, Palos Verdes Peninsula, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed Oct. 16, 1969, Ser. No. 867,015
Int. Cl. F28d *19/04*
U.S. Cl. 165—8 7 Claims

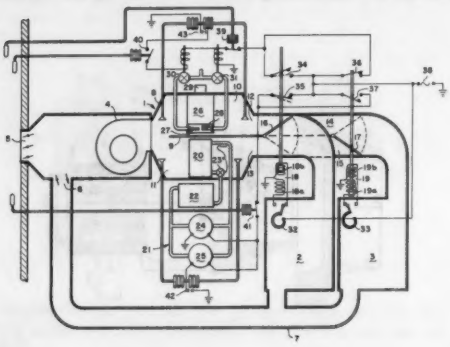


A resilient support and drive system for a rotary regenerator.

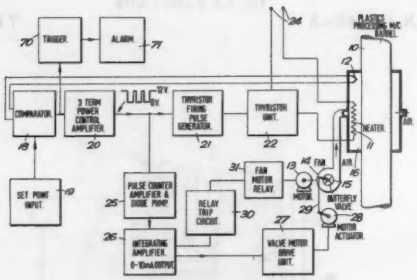
3,612,164
MULTIZONE AIR CONDITIONING APPARATUS
Robert G. Miner, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.
Filed Apr. 17, 1970, Ser. No. 29,435
Int. Cl. F24f *3/00*
U.S. Cl. 165—22 10 Claims

A multizone air conditioning apparatus is shown having both a heating deck and a cooling deck. Each deck has a plurality of outlets each leading to one of a plurality of zones to be air conditioned. Each zone is provided with thermostatic control means for selecting the desired amount of air from the heating and cooling decks. The amount of heat exchange

medium delivered to each of the heating and cooling decks is controlled in response to the rate of airflow through each of the decks as measured by the pressure differential across the heat exchanger of each of the heating and cooling decks.



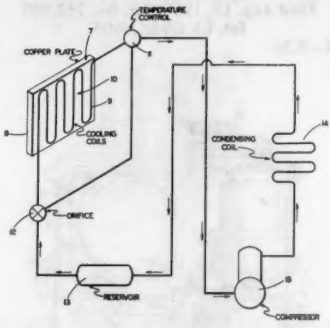
3,612,165
TEMPERATURE CONTROLLERS
Anthony Charles Rendell Haynes, Brighton, England, assignor to Gulton Europe Limited, Brighton, England
Filed Nov. 12, 1969, Ser. No. 875,630
Claims priority, application Great Britain, Nov. 12, 1968, 53660/68
Int. Cl. F25b *29/00*
U.S. Cl. 165—26 **16 Claims**



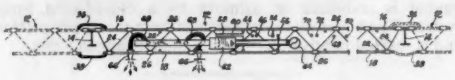
A temperature controller for maintaining temperature at a set point, controls both heating and cooling. Means responsive to a temperature-error signal provide a first output including proportional and integral terms or proportional, integral and derivative terms. This signal is utilized to control heating power and means are provided operative when the heating power is less than a predetermined proportion of the maximum to provide a second output signal for controlling the cooling power. The second output signal is derived directly or indirectly from the first output signal or directly or indirectly from an initiating signal producing the first output signal so that the cooling power increases from a minimum to a predetermined level as the heating power falls from said predetermined level to a minimum.

3,612,166
BURNING BAR ATTACK RESISTANT DEVICE FOR VAULT DOORS
Newton J. Krug, Cincinnati; James D. Shoop, Canton, and Robert J. Bohland, North Canton, all of Ohio, assignors to Diebold, Incorporated, Canton, Ohio
Filed Sept. 8, 1969, Ser. No. 856,114
Int. Cl. B60h *1/00*
U.S. Cl. 165—39 **5 Claims**

A compartment-forming jacket faced on one side with a copper plate, and cooling medium in the compartment or directly acting to carry heat applied to and conducted through the copper plate away from the copper plate. The cooling of the copper plate and maintaining the copper plate at a cool temperature provides a protective device for a vault doors and the like which resists penetration of a burning bar.



3,612,167
MULTIPLEX JOIST SYSTEM
Leonard A. Bihler, 25 West 671 Jewell Road, Wheaton, Ill.
Filed Feb. 24, 1969, Ser. No. 801,378
Int. Cl. F24f *3/00*
U.S. Cl. 165—50 **7 Claims**

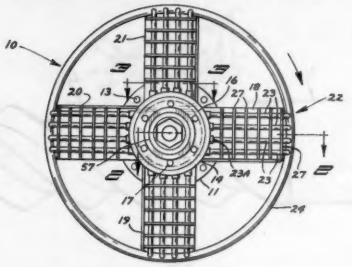


The multiplex joist system comprises a series of spaced parallel joists, each having upper and lower hollow tubular chords with webbing therebetween. At regular intervals the hollow tubular chords of the joists are employed as branch supply and return conduits for the various fluids necessary to service the building, such as heating water, cooling water and chilled water. At regular intervals the hollow chords are also employed to carry electrical lines. One chord may be employed for power lines and the other for signal lines. Various utilization devices may be connected between the hollow tubular chords of the various joists so that the fluids will be circulated through such devices. The electrical lines are also connected to the utilization devices. At frequent intervals, the hollow tubular chords are provided with outlet fittings so that connections may be made at virtually any convenient location. The webbing may be in the form of a zigzag member connected to the tubular chords by means of clips which are welded to the chords and also to the webbing. In some cases, the zigzag member may be in the form of a hollow tube adapted to carry fluids.

3,612,168
ROTATABLE HEAT TRANSFER MEANS
Maurice L. Peterson, Kerkhoven, Minn.
Filed July 10, 1969, Ser. No. 840,658
Int. Cl. F28d *11/00*; F28f *5/00*
U.S. Cl. 165—86 **11 Claims**

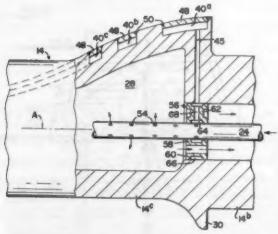
A rotatable heat transfer fan has a plurality of radially extending blades secured to a rotatable hub having fluid inlet and outlet passages. A plurality of radially extending heat exchange tubes are spaced from opposite faces of the blades by a plurality of radially spaced fins secured to the blades and the tubes. The inner ends of the tubes are connected to the inlet and outlet passages in the hub whereby a heat exchange fluid may be circulated through the tubes. The outer ends of each tube is fluidly connected to a tubular ring secured to the outer peripheral portions of the blades. The

tubular ring defines a circumferentially extending annular fluid passage which equalizes the fluid pressure on all of the



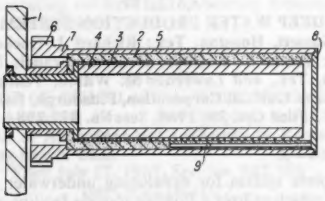
tubes. A pump is operable to force fluid through the tubes. In an alternative nonillustrated embodiment, the heat exchange tubes can be replaced electric heating elements.

3,612,169
TEMPERATURE-CONTROLLED BLADED ROTOR
James T. Matsuoka, Brecksville, and Armindo Cantarutti, Akron, both of Ohio, assignors to Intercole Automation, Inc., Cleveland, Ohio
Filed Feb. 28, 1969, Ser. No. 803,196
Int. Cl. F28f *5/06*
U.S. Cl. 165—86 **2 Claims**



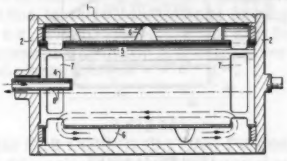
A bladed rotary member for working and/or mixing materials such as rubber, plastic and the like, with helical passageways extending lengthwise of and beneath a generally helically curved surface of a blade portion, through which heat transfer liquid is circulated.

3,612,170
THERMAL TREATMENT ROLL
Paul Juppet, Lyon; Robert Konopatsky, Lyon, and Jean Ruetsch, Tassin, all of France, assignors to Societe Rhodiaceta, Paris, France
Filed Apr. 3, 1969, Ser. No. 813,127
Claims priority, application France, Apr. 3, 1968, 146,894
Int. Cl. F28d *11/02*; **F28f** *5/02*
U.S. Cl. 165—89 **7 Claims**



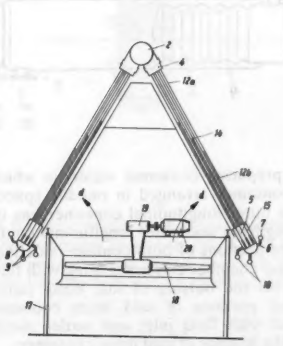
The specification describes a thermal treatment roll, e.g. for heating or cooling a textile yarns etc., wherein a rotor is mounted on a stator which is provided with a heating or cooling means. Between the stator and rotor is a connecting element of a solid, heat-conducting lubricating material, e.g. a ring or rings of sintered metal impregnated with a lubricating oil.

3,612,171
HEATABLE OR COOLABLE ROLLER
Bermann Trautner, Niederwalluf/Rheingau, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany
Filed Aug. 5, 1969, Ser. No. 847,664
Claims priority, application Germany, Aug. 6, 1968, P 17 75 394.5
Int. Cl. F28g *5/02*
U.S. Cl. 165—90 **11 Claims**



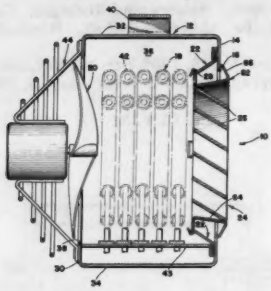
This invention relates to a heatable or coolable roller which comprises a hollow cylindrical exterior shell, at least one hollow cylindrical interior shell secured to the exterior shell and having aperture means therein adjacent each end thereof, flow-causing means on the exterior of the interior shell for causing flow of a heat transfer medium, and means for introducing heat transfer medium into said roller and discharging said medium from said roller.

3,612,172
AIR-COOLED CONDENSER
Dietrich Dohnt, Berlin, Germany, assignor to Borsig Gesellschaft mit beschrankter Haftung, Berlin, Germany
Filed Sept. 22, 1969, Ser. No. 859,829
Claims priority, application Germany, Sept. 25, 1968, P 17 76 130.7
Int. Cl. F28f *13/04*
U.S. Cl. 165—111 **10 Claims**



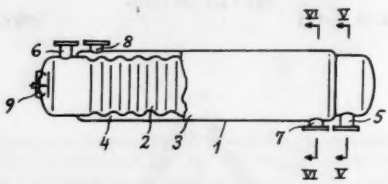
An air-cooled condenser in which pipes extending between an upper header and a lower header are divided into upper and lower axial sections by the upper ends of condensate tubes which lead downwardly to a condensate chamber. Steam is supplied through the headers to opposite ends of the pipes and condensate from the upper section of each pipe draining down the respective tube to the condensate chamber which condensate from the lower section of each pipe drains into the lower header. A fan causes cooling air to pass over the pipes which, for efficient heat transfer, may be finned.

3,612,173
UNIT HEATER DEVICE
Raghbir C. Goyal, Niles, Mich., assignor to Ilg Industries Inc., Chicago, Ill.
Filed Jan. 10, 1969, Ser. No. 790,421
Int. Cl. F24b 3/02
U.S. Cl. 165—122 7 Claims



A unit heater is provided having a housing with an opening in one wall and a fan and heating element adapted to cause heated air to flow through the opening. An air deflector assembly is positioned adjacent the opening by clips which permit rotation of the air deflector assembly as well as easy removal thereof to permit substitution of a different air deflector assembly.

3,612,174
APPARATUS HAVING CONNECTING MEANS BETWEEN CONTAINERS FOR PREPARING CONSUMER WATER
Alfred Vogt, Schaan, and Hellmut Gutmann, Balzers-Mals, both of Liechtenstein, assignors to Gustav Osfselt Hovalwerk AG, Vaduz, Liechtenstein
Filed June 20, 1969, Ser. No. 835,086
Int. Cl. F28d 7/10
U.S. Cl. 165—156 2 Claims



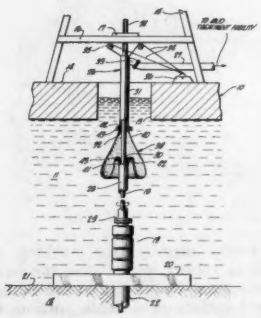
A unit for preparing consumer water, in which an inner longitudinal container arranged in radially spaced relationship within an outer longitudinal container has its end portions protruding from said outer longitudinal container while the coextensive portions of both containers define with each other an annular chamber communicating with fluid inlet and outlet means on the outside of said outer container. The protruding end portions of said inner container likewise being provided with fluid inlet and outlet means communicating with the interior of said inner container.

3,612,175
CORRUGATED METAL TUBING
James A. Ford, North Haven, and Wade Wolfe, Jr., Mount Carmel, both of Colo., assignors to Olin Corporation
Filed July 1, 1969, Ser. No. 838,172
Int. Cl. F28f 1/42
U.S. Cl. 165—179 6 Claims

The instant disclosure teaches an improved corrugated metal tubing having an improved heat-transfer coefficient and having a plurality of lands and grooves extending along the circumference thereof. The grooves comprise at least two independent, continuous grooves extending helically along the circumference of the tube, with each groove being in spaced relationship to each other. Improved heat transfer is obtained by providing that the land width, the groove width

and the angle of advance of the helically extending grooves are related in a particular defined manner.

3,612,176
FLEXIBLE AND EXTENSIBLE RISER
Robert F. Bauer, Whittier; Russell B. Thornburg, Palos Verdes, and Paul R. Rininger, Westlake Village, all of Calif., assignors to Global Marine Inc., Los Angeles, Calif.
Division of Ser. No. 725,784, May 1, 1968, abandoned. Filed Oct. 31, 1969, Ser. No. 870,710
Int. Cl. E21b 7/12
U.S. Cl. 166—.5 4 Claims

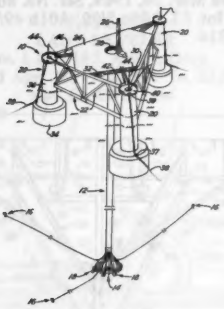


An improved riser structure for use in transporting drilling mud to a floating drilling vessel from a submarine wellhead. The riser structure is defined principally of essentially rigid riser ducting within the length of which, and preferably closer to the vessel than to the wellhead, is disposed a laterally and longitudinally flexible sleeve coupled to the ducting to form a part of a mud flow path from the wellhead to the vessel.

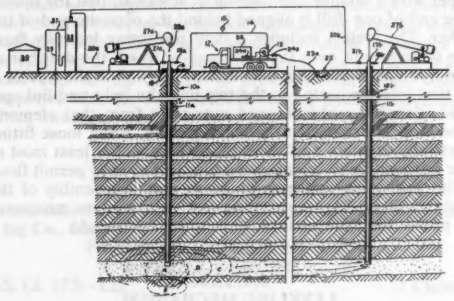
3,612,177
DEEP WATER PRODUCTION SYSTEM
Paul L. Gassett, Houston, Tex.; Richard J. Goeken, Lagos, Nigeria; James E. Knizner, Houston; Francis M. Smith, Houston, Tex., and Lawrence M. Wilson, Ventura, Calif., assignors to Gulf Oil Corporation, Pittsburgh, Pa.
Filed Oct. 29, 1969, Ser. No. 872,298
Int. Cl. F21b 43/01
U.S. Cl. 166—.6 27 Claims

A complete system for developing underwater hydrocarbon fields which utilizes a floating topside facility, a template fixed to the submarine terrain below the topside facility, and a composite riser interconnecting the template and the topside facility. The template includes subsea well bases from

which all the wells are drilled. Guide tubes are provided from the template, through the riser, and up to the topside facility for guiding control lines, flow lines, and the like. An improved substantially vertical entry connection means between the ends of the well lines and the well heads is also provided.



3,612,178
METHOD OF RECOVERING OIL USING FLOW STIMULATING SOLUTION
Walter F. Germer, Jr., Hwy. 111, Edna, Tex., and Carl W. Stringer, 8023 Springtime, Houston, Tex.
Filed Oct. 20, 1969, Ser. No. 867,500
Int. Cl. E21b *43/22*
U.S. Cl. 166—267 3 Claims



The disclosure of a flow-stimulating liquid solution and methods of use is based primarily on the combination of a linear alkyl sulfonate as a detergent and penetrant, serving as a special carrier for a lauric amide emulsifier to draw oil into emulsion and for a phosphate, as sodium phosphate, to draw water into emulsion. A preservative may be added, as a formaldehyde, as to inhibit deterioration due to bacteria, or other factors. Also when in the course of usage, it may be desirous to quicken the setting action, as by clarifying a floated emulsion, a base, as sodium hydroxide, may be added as a stimulant to break the emulsion. The solution may be used in recovering oil from an oil-bearing formation, or in reclaiming contaminated or used oil.

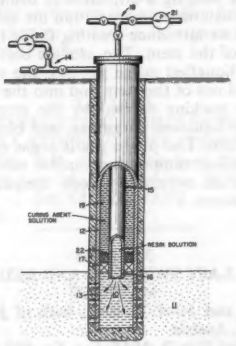
3,612,179
METHOD OF STIMULATING WELL PRODUCTION
James L. Anderson; Ernest M. Cloughly, and Charles L. Smith, all of Arlington, Tex., assignors to Byron Jackson Inc., Long Beach, Calif.
Filed July 17, 1969, Ser. No. 842,700
Int. Cl. E21b *43/27*
U.S. Cl. 166—281 4 Claims

The method of stimulating the production of wells by injecting a body of acid solution into a portion of the earth's formation traversed by a well bore, the acid solution being displaced into the formation by an aqueous solution of a foaming agent, in situ foaming of the foaming agent being caused by the pumping of gas into the formation to commingle with the foaming agent, and the foam plugs off the more permeable formation to allow injection of acid solution into the less permeable formation to break down the less permeable formation not blocked by the foam.

3,612,180
SELECTIVE ZONE CONSOLIDATION OF INCOMPETENT FORMATIONS BY METALLIZATION
Edwin A. Richardson, Houston, Tex., and Leo P. Broussard, New Orleans, La., assignors to Shell Oil Company, New York, N.Y.
Filed Aug. 25, 1969, Ser. No. 852,936
Int. Cl. E21b *33/138*
U.S. Cl. 166—292 1 Claim

A method of consolidating an incompetent heterogeneous earth formation by selectively isolating or plugging off certain zones, e.g., nonproductive zones of said formation, and thereafter consolidating the oil-producing zones with an electroless metal-plating solution.

3,612,181
METHOD FOR CONSOLIDATING INCOMPETENT FORMATIONS
Fred A. Brooks, Jr., Houston, Tex., assignor to Esso Production Research Company
Filed Feb. 16, 1970, Ser. No. 11,495
Int. Cl. E21b *33/138*
U.S. Cl. 166—295 9 Claims



A method for the consolidation of incompetent formations wherein a thermosetting resin is injected into the formation through a first conduit and a curing agent for the resin is injected into the formation through a second conduit.

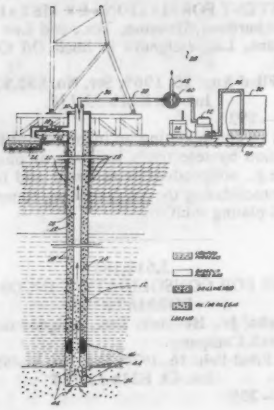
3,612,182
OIL RECOVERY PROCESS
Philip J. Raifsnider, deceased, late of Denver, Colo. (by Dorothy E. Raifsnider, executrix), assignor to Shell Oil Company, New York, N.Y.
Filed Aug. 25, 1969, Ser. No. 853,235
Int. Cl. E21b *43/22*, *43/27*
U.S. Cl. 166—307 10 Claims

In a fluid drive oil recovery process, alternate slugs of acidizing liquid and concentrated, water-swellable, gel-forming surfactant are injected prior to the injection of the drive fluid. The treatment provides improvements such as a more uniform injection profile and increased stability and permeability with respect to an aqueous drive fluid.

3,612,183
PROCESS FOR PURGING A DRILL STEM

Harold E. Shillander, 414½ Central S.E., and Roy M. Eidal, P. O. Box 2087, both of Albuquerque, N. Mex.

Filed Dec. 11, 1969, Ser. No. 884,287
Int. Cl. E21b *21/00, 49/00*
U.S. Cl. 166—312 16 Claims

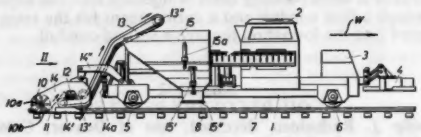


A process for purging a drill stem of drilling fluid and relieving the hydrostatic pressure within the stem to perform a production test or introduce treating fluids into a formation at the bottom of the stem. The process comprises the steps of: pumping a liquefied purge gas into the stem to displace the drilling fluid out of the stem and into the annulus; setting an expandable packing carried by the stem; relieving the pressure on the liquefied purge gas; and bleeding the purge gas from the stem. The purge gas is a gas capable of being liquefied at ambient temperatures under moderate pressures yet is gaseous at normal ambient temperatures and atmospheric pressures.

3,612,184
MOBILE BALLAST SWEEPING AND REDISTRIBUTION MACHINE

Franz Plasser, and Josef Theurer, both of Johannesgasse 3, 1010 Vienna, Austria

Filed Mar. 3, 1969, Ser. No. 803,570
Claims priority, application Austria, Mar. 20, 1968, A 2786/68
Int. Cl. E01b *27/00*
U.S. Cl. 171—16 8 Claims

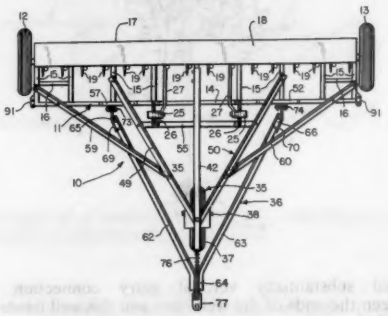


A mobile ballast sweeping and redistributing machine comprises a rotary broom, ballast conveyor means continuously operable independently of the machine movement for conveying the swept ballast away from the broom, and means for the continuous redistribution of the ballast received from the conveyor means.

3,612,185
IMPLEMENT SYSTEMS

Darrel Grauberger, and Roy Grauberger, both of R.R. # 2, Fleming, Colo.

Filed Mar. 24, 1969, Ser. No. 809,630
Int. Cl. A01c *5/00*; A01b *49/00*
U.S. Cl. 172—314 10 Claims



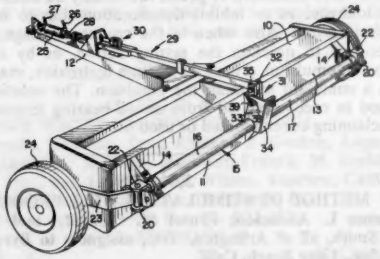
An agricultural implement system includes at least two towed units with each having a frame carried between a pair of wheels. As illustrated, the frame supports a seed drill. Each of the units has a castor wheel assemblage rigidly but adjustably fixed from and ahead of its frame. A V-shaped drawbar is secured to each frame so as to swing vertically and is suspended in an adjustably fixed horizontal position from the respective castor wheel assemblage.

The two units may be towed in common behind a tractor by means of a hitch system that locates one unit behind the other with a relative overlapping of wheels so that the operative end of one drill is aligned behind the opposite end of the other. The system includes a strut projecting laterally from the forward unit onto the outer end of which the drawbar of the rear unit is coupled. An element coupled to the tractor is in turn interconnected to the two units by links and linkages that resemble spokes fanned outwardly from that element. The strut is arranged to swing vertically, while loose-fitting vertically oriented pins serve to interconnect at least most of the different links, linkages and the strut so as to permit flexibility and quick and easy assembly and disassembly of the system. The different coupling elements also are structured to permit the units, instead, to be towed in cascade.

3,612,186
LEVELING MECHANISM

Jerome L. Fueslein, Linden, Calif., assignor to International Harvester Company, Chicago, Ill.

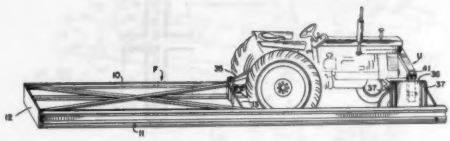
Filed Dec. 29, 1969, Ser. No. 888,684
Int. Cl. A01b *63/22*
U.S. Cl. 172—421 3 Claims



In an earth-scraping implement of the transversely elongated type supported by laterally spaced wheels which can be vertically moved to raise and lower the implement, the wheels are mounted on arms affixed to and projecting from a

transverse rockshaft formed of two parts, one of which can be angularly adjusted relative to the other to level the bowl and scraper blade.

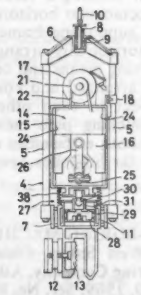
3,612,187
LAND LEVELER
Price H. Glass, Rte. 1 Box 187, Amity, Oreg.
Filed Apr. 28, 1970, Ser. No. 32,546
Int. Cl. E02f *3/64*
U.S. Cl. 172—780 10 Claims



This specification discloses a land leveler comprising a massive rectangular frame including reinforced side bars and three crossbars that engage the ground surface for leveling purposes. These are a tail bar, an intermediate bar and a front bar which is pivotally mounted on the side bars. It may be lowered into position on the ground surface to permit a tractor to be backed thereover into the space between the front and intermediate bars. An inverted U-shaped frame is secured to the front end of the tractor and side legs thereof carry rollers which ride on wear plates upstanding from the side bars.

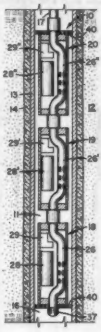
The section between the intermediate crossbar and tail bar is more extensive than the tractor-receiving section and is provided with diagonal braces. Thus, it is appreciably heavier than the tractor-receiving section. Upstanding from the intermediate crossbar is a bracket which is pivotally connected to the standard drawbar of the tractor hoist. The U frame at the front end of the tractor is provided with stops which cooperate with the wear plates in limiting upward movement of the front end.

3,612,188
NOISELESS PILE DRIVER
Takenosuke Ono, Tokyo, Japan, assignor to North Engineering Co., Ltd.
Filed July 10, 1970, Ser. No. 53,877
Int. Cl. E02d *7/00*
U.S. Cl. 173—122 7 Claims



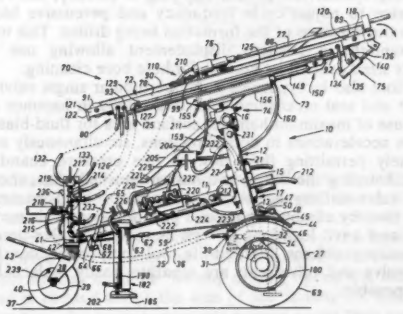
A pile-driving apparatus in which the inertia of a reciprocated weight produces a force impulse at one end of each stroke which is applied to the head of a pile via an impact-enforcing mechanism which includes resilient means such as a cushion of air or oil, thereby driving the pile in a relatively quiet manner without the noise of hammer impacts.

3,612,189
WELL PERFORATING AND TREATING APPARATUS
Fred A. Brooks, and Leroy H. Simons, both of Houston, Tex., assignors to Esso Production Research Company
Filed Oct. 24, 1969, Ser. No. 869,156
Int. Cl. E21b *43/117, 43/119*
U.S. Cl. 175—4.54 10 Claims



A well completion apparatus for perforating and injecting a fluid into a formation surrounding a cased wellbore. The apparatus includes a body unit defining an enclosed chamber, a perforator mounted in the chamber, a conduit in fluid communication with the chamber and adapted to conduct fluid from the surface to the chamber, and a mechanism for firing the perforator to form a flow passage between the formation and the chamber.

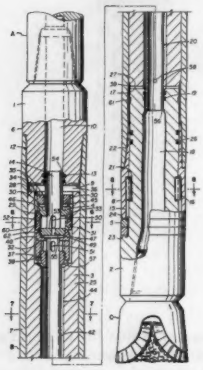
3,612,190
ROCK DRILL SUPPORTING VEHICLES FOR CUT-AND-FILL STOPPING OPERATIONS
Mac Gordon Wills, R.R. # 2, Chelmsford, Ontario, Canada
Filed Apr. 24, 1970, Ser. No. 31,587
Int. Cl. E21c *11/02*
U.S. Cl. 173—20 10 Claims



A rock drill supporting vehicle particularly intended for use in cut-and-fill stopping operations has one or more fluid-operated drill guiding and supporting cable cylinders adjustably mounted on a chassis structure of the vehicle. Three spaced-apart hydraulic jacks are provided for levelling the vehicle on the mine floor and a bubble level is provided on the vehicle for indicating when the vehicle has been moved into a level disposition. With this structure, a constant but

adjustable predetermined drill hole angle is obtained. A fixed lug permanently secured to one of the vehicle functions as an odometer and permits accurate control of drill hole separation.

3,612,191
PERCUSSION DRILLING TOOL
Leo Andrew Martini, 5920 Sandhurst, Dallas, Tex.
Filed Mar. 11, 1970, Ser. No. 18,635
Int. Cl. E216 *1/00*
U.S. Cl. 173—73 **12 Claims**

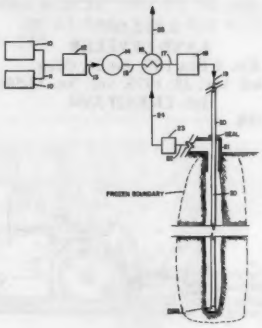


A unique percussion motor is disclosed that is operable on liquid or gaseous fluid under pressure for rotary drilling of oil, gas, and water wells, geophysical holes, open strip mining blastholes, construction holes and the like for greatly increasing the rate at which said boreholes are drilled. This comparatively simple prime mover produces sustained high-frequency, high-longitudinal-force spikes on a drill bit by synchronizing application of percussive force and drill collar weight energy and superimposes one force upon the other to obtain instantaneous anvil accelerations of much greater magnitude than either force could, acting separately, to produce rock-crushing forces of greater effectivity. Rebound of tough elastic masses is also used to decided advantage for conserving system energy and applying it usefully, allowing this device to adjust cycle frequency and percussive blow force to the hardness of the formation being drilled. This tool has essentially a positive displacement allowing use of properly sized drill bit jet nozzles for hole bore cleaning.

This tool also incorporates a unique tubular single valving element and seat arrangement located totally in hammer allowing use of maximum hammer surface area for fluid-biased hammer accelerations in both directions, simultaneously and alternately permitting fluid flow to one pressure chamber while exhausting the other, and has an unusually fast, short-stroke valve-shifting action at the end of each hammer stroke, thereby eliminating precise part dimensions, hammer stroke, and anvil locations as well as reducing valve-timing and erosion problems. Limited-life tool components consisting of valve and valve seats are separate, easily replaceable and disposable.

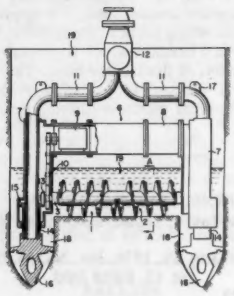
3,612,192
CRYOGENIC DRILLING METHOD
James Q. Maguire, Jr., 210 N. Sherry, Norman, Okla.
Filed Apr. 14, 1969, Ser. No. 822,839
Int. Cl. E21b *21/04*
U.S. Cl. 175—17 **11 Claims**

A process for air drilling by cooling the air to cryogenic temperatures, forcing the cooled air down the drill column and up the well bore. The cold air will cause the well bore to freeze eliminating many of the problems in air drilling such as water influx and sloughing of shale. The process will also permit efficient use of the electric drill. The process may also



be applied to other gaseous drilling fluids such as, for example, natural gas, nitrogen, propane, neon and the like.

3,612,193
RECTANGULAR DRILLING FOR EARTH EXCAVATION
Shigeru Hirata, Tokyo, Japan, assignor to Kajima Kensetsu Kabushiki Kaisha, Minato-ku, Tokyo, Japan
Filed Aug. 11, 1969, Ser. No. 848,849
Claims priority, application Japan, Aug. 26, 1968, 43/60436
Int. Cl. E21b *11/00, 7/00*
U.S. Cl. 175—91 **4 Claims**

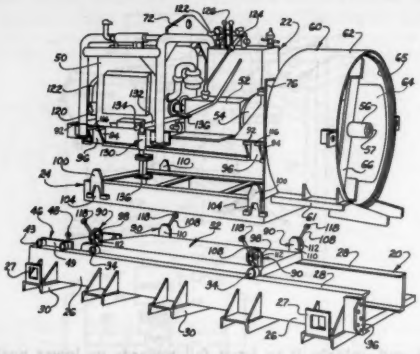


A drilling machine for forming a vertical hole having an oblong and somewhat rectangular horizontal cross section in the earth, comprising a supporting frame housing a driving means which drives a horizontally arranged auger which is supported by the supporting means and comprises two spiral screw threads coaxially arranged and completely symmetrically formed with respect to each other. The supporting means supports a soil-sucking pipe means at its bisected branches arranged over both extremities of the auger and is provided with bits under the branches, respectively.

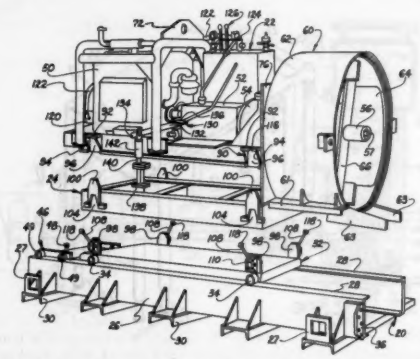
3,612,194
EARTH-BORING MACHINE
Albert R. Richmond, West Salem, Ohio, assignor to The Richmond Manufacturing Company, Ashland, Ohio
Filed Oct. 20, 1969, Ser. No. 867,814
Int. Cl. E21c *1/10*
U.S. Cl. 175—122 **6 Claims**

A machine for the horizontal boring of shafts for the insertion of pipelines where excavation from the surface is undesirable, such as under freeways or the like, which comprises a boring mechanism for forming the holes as well as the push function for advancing the pipeline casings. This novel arrangement includes a pusher ring frame which is removably mounted on the track means and a power means

frame which is in turn removably mounted on said pusher ring frame such that the frames can be removed from one another or removed from the carriage as an assembly. More particularly, the base means on the track includes a novel latch means for selective movement between a retracted released position and an extended latch position provided with means for selected shifting between said positions.



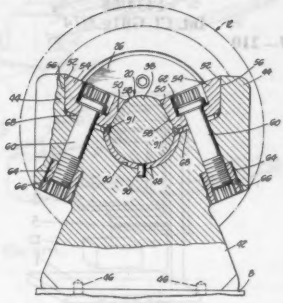
3,612,195
EARTH-BORING MACHINE
Albert R. Richmond, West Salem, Ohio, assignor to The Richmond Manufacturing Company, Ashland, Ohio
Filed Oct. 20, 1969, Ser. No. 867,816
Int. Cl. E21c *1/10*
U.S. Cl. 175—122 **12 Claims**



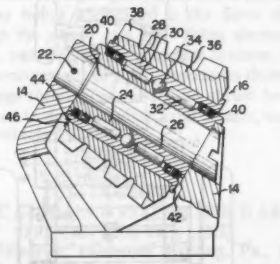
A machine for the horizontal boring of shafts for the insertion of pipelines where excavation from the surface is undesirable, such as under freeways or the like, which comprises a boring mechanism for forming the holes as well as the push function for advancing the pipeline casings. This novel arrangement includes a pusher ring frame which is removably mounted on the track means and a power means frame which is in turn removably mounted on said pusher ring frame such that the frames can be removed from one another or removed from the carriage as an assembly.

3,612,196
ROCK-BORING CUTTER
Robert L. Dixon, Whittier, Calif., assignor to Smith International, Inc., Newport Beach, Calif.
Filed May 1, 1970, Ser. No. 33,819
Int. Cl. E21c *13/12*; F16c *19/08*
U.S. Cl. 175—364 **8 Claims**

A cutter assembly particularly adapted for use on headplates of rock-boring tools wherein a plurality of cutters are closely positioned end-to-end, the cutters being supported by journals having restricted endwise movement in their mounts, and the mounts including journal end receiving saddles and clamping means releasably overlying the journal ends to permit removal of the journals and the cutters mounted thereon away from the headplate in a direction transversely of the journals.

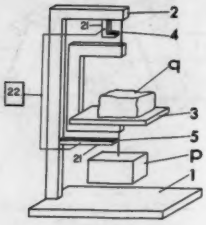


3,612,197
BIG HOLE DRILLING BIT
Hiroyasu Motoyama, Tokyo, Japan, assignor to Koken Sisui Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 3, 1969, Ser. No. 873,266
Claims priority, application Australia, Dec. 24, 1968, 48341/68
Int. Cl. E21b *9/10, 9/36*; F02f *15/44*
U.S. Cl. 175—364 **3 Claims**



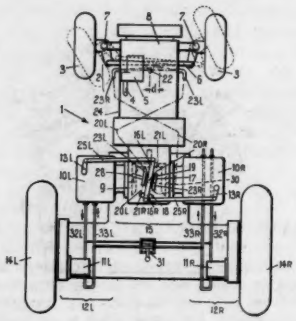
An improved large diameter hole drilling bit consisting of a cutter head with a plurality of yokes fixedly mounted on the cutter head and a like plurality of roller cutters each rotatably mounted on a yoke. The drilling bit is adapted to be supported by a drilling rod which is rotated by a power unit of the drilling machine. During drilling operation, the cutter head is rotated about the axis of the drilling bit and at the same time the roller cutters are rotated about their own axes with respect to the yokes by contact to the rock or the like. Each roller cutter includes a load pin supported by the yoke fixed on the cutter head, a cutter cone having cutting teeth or individually replaceable tips thereon and bearing balls and/or rollers interposed between the cutter cone and the load pin so that the cutter cone is supported for free rotation on the load pin. Pressure-responsive seals and dust filters prevent foreign material from passing into the bearings. The load pin, cutter cone and bearing are preferably held in permanent assembly.

3,612,198
ELECTRICAL MASS METER
Mario Gallo, Zurich, Switzerland, assignor to Wirth, Gallo & Co., Zurich, Switzerland
Filed Oct. 8, 1968, Ser. No. 765,879
Claims priority, application Switzerland, Jan. 26, 1968, 1434/68
Int. Cl. G01g 3/14
U.S. Cl. 177—210 5 Claims



A mass meter comprising a baseplate, a weighing platform and two electronically excited, transversely vibratable pretensioned strings, wherein the first string is tensioned by a pretensioning mass and the second string is tensioned by a mass to be measured.

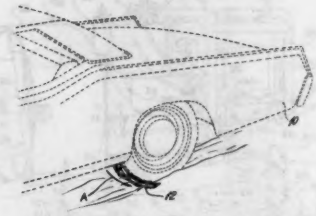
3,612,199
VEHICLE
Herbert Vissers, Nieuw-Vennep, Netherlands, assignor to Landbouwwerktuigen Machinefabriek H. Vissers N.V., Nieuw-Vennep, Netherlands
Filed Sept. 3, 1969, Ser. No. 854,966
Claims priority, application Netherlands, Sept. 9, 1968, 68.12831
Int. Cl. B62d 11/04
U.S. Cl. 180—6.32 6 Claims



A vehicle having wheels which are each driven by hydraulic gears which are provided with such a control mechanism for controlling the speed of rotation and the relative speed of operation of said driven wheels that the adjustment of the travel direction and the adjustment of the travel speed do not influence each other, resulting in the vehicle having improved steering characteristics.

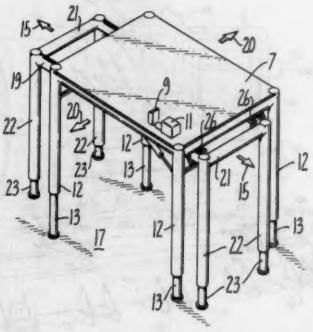
3,612,200
TRACTION DEVICE FOR A SPINNING TRACTION WHEEL
Rene E. Cailyer, 3032 Laurier Ave. East, Montreal 405, Quebec, Canada
Filed Oct. 17, 1969, Ser. No. 867,151
Int. Cl. B62d 57/00
U.S. Cl. 180—7 4 Claims

A mat extending over a segment of a traction wheel of a vehicle and spaced therefrom in its upper position is mounted on the casing of the axle of the wheel so as to eccentrically rotate thereabout to touch the tire in its lower position. A device locks the mat in its upper inoperative posi-



tion and unlocks it to let it fall towards its lower position when additional traction is needed. The device locks back the mat in its upper position to which it returns by the spinning of the wheel.

3,612,201
SELF-PROPELLED PLATFORM TOWER
Richard H. Smith, 30 Bates Road, Hillsborough, Calif.
Filed June 18, 1970, Ser. No. 47,299
Int. Cl. B62d 57/02; E02b 17/00
U.S. Cl. 180—8 E 1 Claim

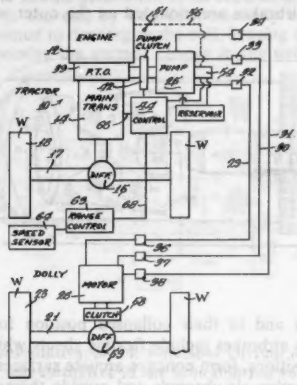


This invention relates to a deck or work platform supported so that it can be moved in a selected direction and to a selected extent over the ground both under water and on land. It may be used on the sea bottom, particularly in an offshore location. It may also be used on tundra, muskeg, swampy locations and the like.

3,612,202
HYDROSTATIC WHEEL ASSIST
Harry C. Moon, Jr., Ogelsby, and John W. Pinkerton, La Salle, both of Ill., assignors to Sundstrand Corporation
Filed June 2, 1969, Ser. No. 829,440
Int. Cl. B62d 59/04
U.S. Cl. 180—14 A 18 Claims

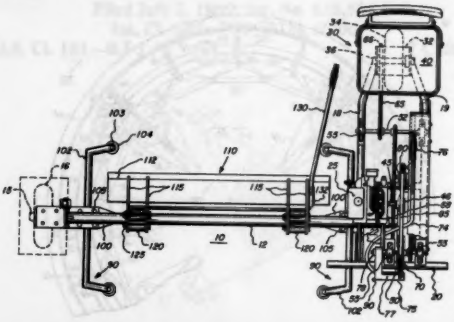
A hydrostatic assist drive for a tractor-trailer driven by the prime mover of the tractor, that may be selectively initiated to drive the wheels of the trailer through a two-speed differential, there being provided a control which maintains the torque of the hydrostatic drive a percentage of the total tractive effort of the tractor-trailer, and also a delay device on the torque control for the hydrostatic drive to maintain the

tractive effort provided by the hydrostatic assist drive during shifting of the main tractor transmission, there being also



provided a valve for unloading the hydrostatic drive train during shifting of the two-speed differential.

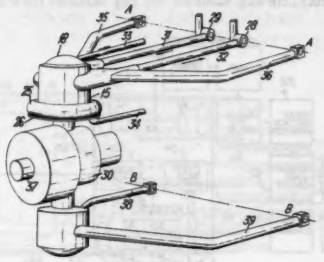
3,612,203
WHEELED IMPLEMENT
Floyd W. Kuecker, 1620 S. 29th St., La Crosse, Wis.
Filed Aug. 25, 1969, Ser. No. 852,771
Int. Cl. B65f *3/00*
U.S. Cl. 180—25 **9 Claims**



A wheeled implement and an improved power transmission for employing a gasoline engine or equivalent unidirectional rotating power source in which a lever-mounted belt-drive system is positioned in contact with a pulley on an output shaft of the engine selectively at varying points thereon and held in contacting relationship therewith to impart rotation to the belt system which is coupled through positive drives to the wheels of an implement. The implement includes a scraper blade which is adjustably positioned about portions of the frame and the structure is guided by means of additional guide wheels positioned on the frame and contacting a portion of the surface to be worked.

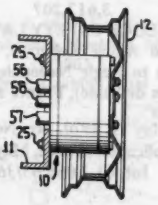
3,612,204
VEHICLE WHEEL SUSPENSION
Arthur Frederick Allen, Littleover, Derby, England, assignor to Rolls-Royce Limited, Derby, England
Filed Apr. 7, 1969, Ser. No. 813,818
Claims priority, application Great Britain, Apr. 15, 1968, 16382/68
Int. Cl. B60k *17/30*
U.S. Cl. 180—43 R **18 Claims**

A vehicle wheel suspension for a wheel having a hydrostatic motor mounted thereon comprises a ball joint between one of the suspension arms and the motor, the ball joint being apertured to allow passage of working fluid between



the rotor and the arm.

3,612,205
FLUID MOTOR
George M. Barrett, R.R. # 5, Galt, Ontario, Canada
Filed Apr. 25, 1969, Ser. No. 819,155
Int. Cl. B60k *7/00*
U.S. Cl. 180—66 F **7 Claims**

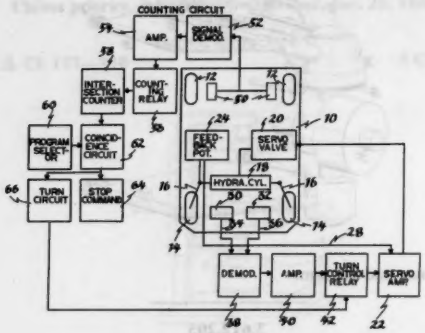


A fluid motor which is particularly constructed for mounting a driven member substantially concentric thereto with the driven member being preferably in the form of a vehicle wheel although the motor can drive other elements such as pulleys, shafts, etc. One of the principal features of the fluid motor is the arrangement of the components thereof, the use of fluid bearings throughout, and fluid thrust bearings particularly adapted to accommodate axial thrusts, such as those imposed by a vehicle wheel.

3,612,206
AUTOMATIC GUIDANCE SYSTEM FOR WAREHOUSE TRUCKS AND THE LIKE
Frederick F. Ohntrup, Plymouth Meeting, Pa., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed July 7, 1969, Ser. No. 839,417
Int. Cl. B62d *5/04*
U.S. Cl. 180—98 **20 Claims**

A self-steering vehicle such as a warehouse truck is guided over a preprogrammed path by guidance wires which are arranged to form an *x*-*y* coordinate grid. The vehicle navigates by following a first coordinate guidance wire while counting the number of second coordinate guidance wires which it crosses. When the number of crossings counted indicates arrival at a particular grid intersection where a 90° course change is required, the vehicle executes a right angle turn. Thereafter it follows one of the second coordinate wires while counting first coordinate wire crossings. A series-connected sinuous wire configuration simplifies the problems of energizing the wires, to make them detectable by inductive sensors on board the vehicle. The excitations applied to the two coordinate wires are 90° out of phase with each other, so as to cancel steering errors which would otherwise be caused by a distortion of the guidance wire fields which occurs when permeable material is in, on, or adjacent to the vehicle. The

90° course changes are accomplished by a pivotal maneuver; a special type of in-place turn which avoids losing the orientation of the vehicle relative to the guidance wires. A perpendicularity sensing circuit detects when the pivotal turn has been completed and the vehicle has been rotated into proper alignment with the next coordinate wire to be followed.



3,612,207

VEHICLE DOOR LOCK SAFETY LATCHING SYSTEMS

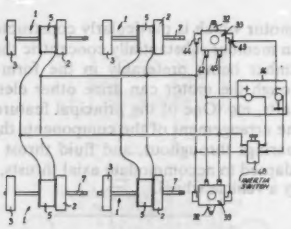
Alain Cabanes, and Andre Lefeuvre, both of Billancourt, France, assignors to Regie Nationale des Usines Renault, Billancourt (Hauts de Seine), France and Automobiles Peugeot, Paris, France

Filed May 11, 1970, Ser. No. 36,113

Claims priority, application France, May 19, 1969, 69/16090

Int. Cl. E05b *65/36*

U.S. Cl. 180—112 7 Claims



This latching system comprises a control member with, for each door, a coil movable axially between a pair of ferrite disks, the reversal of current in the coil causing the reversal of the direction of travel thereof, all the coils being connected in parallel to the output terminals of at least one four-pole reversing switch of the transistory action, front-contact type, connected to a source of current, the control member constituting a compact unit independent of the door lock, said reversing switch being adapted to be actuated by means of either an external key for the front door lock or a control member accessible from the interior of the vehicle.

3,612,208

AIR-CUSHION VEHICLE WITH REVERSE THRUST BRAKES

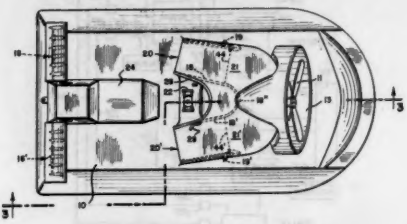
Hugo S. Ferguson, Averill Park, N.Y., assignor to Air Cushion Vehicles, Inc., Poestenkill, N.Y.

Filed Apr. 20, 1970, Ser. No. 30,160

Int. Cl. B60v *1/14*

U.S. Cl. 180—120 7 Claims

A single propeller mounted toward the front of the vehicle provides both propulsion and air cushion. Two point steering is provided by front and rear steering vanes with air channels on each side which direct a portion of the downstream flow of air, under the control of the front vanes, to the rear vanes. To reduce forward thrust without reducing engine power, collapsible airbrakes are mounted on the outer walls of the air channels and in their collapsed position form a part thereof. The airbrakes include flexible sheets which in their extended positions, form concave arcuate surfaces extending across respective air channels and outside thereof to intercept downstream flow of air and divert it outwardly of the vehicle.



3,612,209

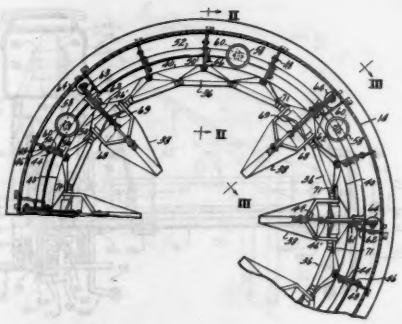
PROPULSION NOZZLE WITH COMBINED THRUST REVERSER AND SOUND SUPPRESSOR MECHANISM

John W. Vdoviak, and Roy A. Krabacher, both of Cincinnati, Ohio, assignors to General Electric Company

Filed Nov. 28, 1969, Ser. No. 880,815

Int. Cl. B64d *33/06*; F01n *1/14*

U.S. Cl. 181—33 HC 9 Claims



A convergent-divergent nozzle for supersonic propulsion is shown. Flaps are pivotally mounted at the throat of the divergent, secondary nozzle and form a part of the secondary nozzle during normal supersonic propulsion. Spaced flaps, on opposite sides of the nozzle, are pivoted inwardly for sound suppression. All of the flaps are pivoted inwardly to block the hot gas stream and direct it forwardly and laterally through blow-in doors to provide reverse thrust. The flaps are controlled by a unique linkage system.

3,612,210

PNEUMATIC SOUND SOURCE EMPLOYING AN ELECTROMAGNET FOR CONTROLLING ITS RELEASE VALVE

George B. Loper, Duncanville, Tex., assignor to Mobil Oil Corporation

Continuation-in-part of application Ser. No. 663,800, Aug. 28, 1967, now Patent No. 3,506,085, dated Apr. 4, 1970.

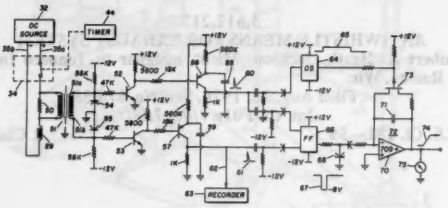
This application Feb. 27, 1970, Ser. No. 14,904

Int. Cl. G01v *1/38*

U.S. Cl. 181—.5 8 Claims

The specification disclosed a pneumatic sound source comprising a pressure chamber for receiving gas and having a

controllable valve for opening and closing an outlet port. An electromagnet including an electrical coil is energized to hold the valve in its closed position and is deenergized for releasing the valve for the generation of an acoustic pulse. Current is applied to the coil by way of a normally closed switch which is opened to deenergize the coil. Sensing means is provided for sensing the current change in the coil to produce

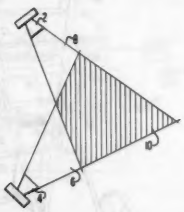


signals representative of the time that current flow is interrupted and representative of the time that the valve begins to move to its open position. Opposing surfaces of the valve and electromagnet are coated with a thin layer of aluminum to provide an nonmagnetic gap and to provide corrosion protection. In addition, a simple seal is provided for sealing the chamber. This seal comprises a metal rim surrounding the port for contacting a disklike resilient member coupled to the valve surface facing the electromagnet.

3,612,211
METHOD OF PRODUCING LOCALLY OCCURRING INFRASOUND

William T. Clark, III, Number Six Davis Blvd., New Orleans, La.

Filed July 2, 1969, Ser. No. 838,564
Int. Cl. G01s *7/52*; G10k *10/00*
U.S. Cl. 181—0.5 J **7 Claims**



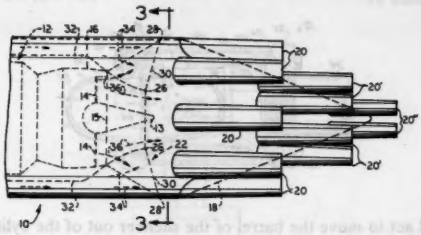
Two spaced directional acoustical transducers are directed towards a common point so that the acoustical waves produced thereby intersect throughout a given area. By utilizing a frequency difference between the acoustical waves of less than 20 Hz., or by propagating the acoustical waves at the same frequency while phase modulating one of them at less than 20 Hz., resultant acoustical waves of less than 20 Hz. are produced in the area of intersection.

3,612,212
METHOD AND APPARATUS FOR SUPPRESSING THE NOISE OF A JET ENGINE

Howard R. Macdonald, San Diego, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed Aug. 11, 1969, Ser. No. 849,070
Int. Cl. B64d *33/06*; F01n *1/14*
U.S. Cl. 181—33 HC **5 Claims**

A housing surrounds the aft portion of a jet engine and extends rearwardly from the aft end thereof, the housing terminating in a plurality of spaced-apart nozzles which extend different distances in the downstream direction. If the engine is of the fan-jet type, a convoluted ring is preferably attached to the aft end of the engine and the portion of the housing which is disposed between the aft end of the ring and the forward ends of the nozzles serves as a mixing chamber for fan air and exhaust gas. Ambient air flows around the nozzles and mixes with exhaust gas (or exhaust gas and fan air where

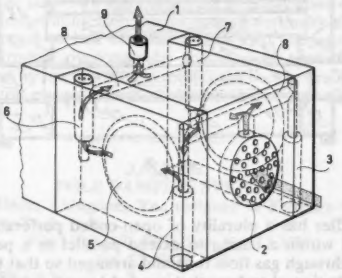


a fan-jet engine is used) discharged from the nozzles, producing turbulence at selected locations in the exhaust plume of the engine and thereby directing sound energy in predetermined direction.

3,612,213
SILENT HOUSING FOR AIR PUMPS AND COMPRESSORS

Zoltan Piko, Budapest, Hungary, assignor to Medicor, Budapest, Hungary

Filed May 8, 1970, Ser. No. 35,707
Claims priority, application Hungary, May 12, 1969, ME-1061
Int. Cl. G10k *11/04*
U.S. Cl. 181—33 K **6 Claims**



A silent housing for air pumps and compressors is of sound-deadening material and has an air inlet filter, a pair of air intake resonant valves tunable to an upper frequency of the pump or compressor, and a pair of outlet valves tuned to the same frequency as the intake valves and discharging in opposite directions into a common outlet channel for sound interference.

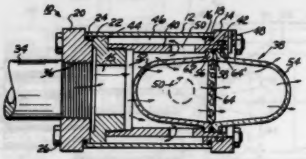
3,612,214
PRESSURE RELEASE SAFETY INDUSTRIAL AIR EXHAUST SILENCER

Leland Francis Blatt, 24121 Mound Road, Warren, Mich., and Frank H. Wiesenhofer, East Detroit, Mich.

Filed Nov. 19, 1970, Ser. No. 91,125
Int. Cl. F01n *1/10, 1/20, 3/00*
U.S. Cl. 181—37 **12 Claims**

An air exhaust silencer comprises a barrel which has a piston head, the barrel is contained for reciprocation within a cylinder and is normally retained in the cylinder in a retracted position so as to permit air exhaust through the silencer structure which embodies a pair of gas permeable frequency distorters adapted to muffle the noise of the exhaust air to below a predetermined maximum noise level; the barrel of the silencer is provided with a plurality of relief ports which are in open communication with the barrel

retaining cylinder, mechanical releasable retaining means are employed to normally retain the barrel in the retracted position, however, upon buildup of back pressure in the silencer assembly, due to clogging of the gas permeable members of the silencer, the increased air pressure through the silencer



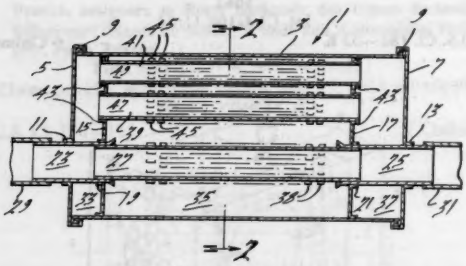
will act to move the barrel of the silencer out of the cylinder overcoming the force of the retaining means to expose the relief ports of the barrel to the atmosphere to thereby permit air pressure to bypass said clogged gas permeable members of the silencer for direct passage to the atmosphere.

3,612,215

MULTILOUVERED ROUGHNESS SILENCER

Bert Du Bois, Brooklyn, Mich., assignor to Tenneco Inc., Racine, Wis.

Filed July 27, 1970, Ser. No. 58,396
Int. Cl. F01n *1/04, 1/10*
U.S. Cl. 181—48 7 Claims



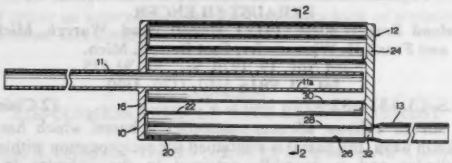
A muffler has a plurality of open-ended perforated tubes mounted within a casing to extend parallel to a perforated straight-through gas flow tube and arranged so that they provide expansion chambers that are fed by gas pulses emanating radially from the flow tube.

3,612,216

MUFFLER CAN

Otto E. Rieder, Etobicoke, Ontario, Canada, assignor to General Impact Extrusions (Manufacturing) Ltd., Toronto, Ontario, Canada

Filed Dec. 1, 1969, Ser. No. 881,192
Int. Cl. F01n *1/08, 7/18*
U.S. Cl. 181—53 1 Claim



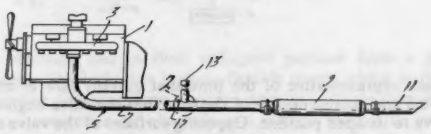
This invention relates to a muffler can for use in the muffling of devices such as compressors for air conditioning units. The novelty of the device consists of the manner in which the resistance path for the exhaust fluids is arranged. It consists essentially of a series of baffle paths within a can which are formed by tubular extensions from each of the end walls of the can. Each of the tubular baffles originates with a wall and stops short of the opposite wall. All tubular baffles have a substantial portion of their extent coextensive with all others so that in effect a series of interconnected baffle paths is formed in the casing that progresses in a radial direction from the center baffle.

3,612,217

ANTIWHISTLE MEANS FOR EXHAUST SYSTEM

Robert A. Heath, Jackson, Mich., assignor to Tenneco Inc., Racine, Wis.

Filed Aug. 26, 1970, Ser. No. 67,035
Int. Cl. F01n *1/02, 7/00*
U.S. Cl. 181—59 1 Claim



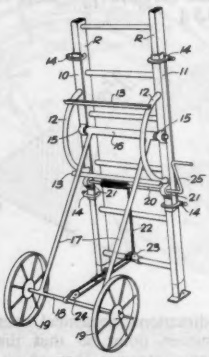
A gas passage conduit of the type used in internal combustion engine exhaust systems has an outwardly extending recess formed in its wall adjacent a sharp-edged hole that is connected to the housing of a sound attenuating chamber.

3,612,218

LADDER CARRIAGE

Charles W. Blair, Route 3 Box 273, Cortland, Ohio, and Margaret C. Blair, executrix, of said Charles W. Blair, deceased

Filed Mar. 3, 1970, Ser. No. 16,189
Int. Cl. E06c *5/24*
U.S. Cl. 182—127 2 Claims



A ladder carriage for transporting and erecting a ladder includes a frame attachable to the ladder inwardly from an end thereof, trailing arms pivoted to the frame and a wheel and axle assembly carried on the trailing arms. A winch mounted on the frame is provided to move a rope thereon which is also trained over a pulley on the wheel and axle assembly so that the wheel and axle assembly may be moved in pivotal relation to the ladder whereby the ladder may be moved from substantially horizontal to the substantially vertical position.

3,612,219

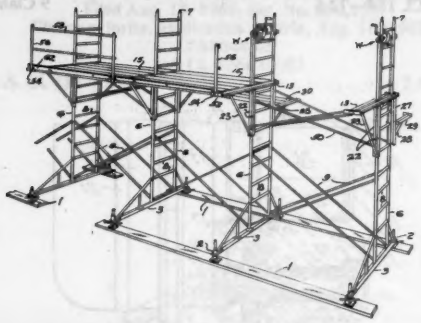
SCAFFOLD STRUCTURE

Robert W. Fortner, Memphis, Tenn., assignor to Bluff City Manufacturing Co., Inc., Memphis, Tenn.

Filed Feb. 11, 1970, Ser. No. 10,368
Int. Cl. E04g *1/20*
U.S. Cl. 182—146 9 Claims

A ground-supported scaffold for use in erecting a building wall, having at least two upright ladderlike frames spaced

apart lengthwise of the scaffold, a platform-mounting carriage vertically movable on each of two adjacent frames, and a winch including attaching elements readily applicable to and removable from a selected rung on each upright frame.

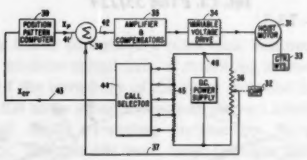


The winch is manually actuated to wind up a cable to lift one of the carriages. Preferably each carriage has spring-actuated latches automatically engaging successive rungs on the respective frame as the carriage is raised to support the carriage independently of the winch and cable.

3,612,220
ELEVATOR CONTROL

Donivan L. Hall; Richard C. Loshbough, and Gerald D. Robaszkiewicz, all of Toledo, Ohio, assignors to The Reliance Electric and Engineering Company, Cleveland, Ohio

Division of Ser. No. 380,385, July 6, 1964, Pat. No. 3,523,232.
Filed Oct. 29, 1969, Ser. No. 872,184
Int. Cl. B66b *1/30*
U.S. Cl. 187—29 R 30 Claims

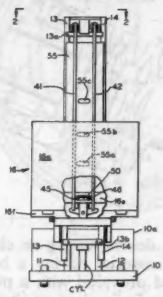


A commanded position signal generator adapted for position based servocontrols as applied for example to elevators wherein the commanded position at which the controlled object will stop while subject to constraints of constant jerk, constant maximum acceleration, and constant maximum velocity is indicated through accelerating and constant velocity intervals. Stopping distance computation is performed in a first computation mechanism throughout the interval the commanded position signal is operating in an accelerating mode. Means recognize the mode of commanded position signal generation which is currently effective. As acceleration is curtailed to bring the commanded position signal into a constant velocity mode, a storage mechanism maintains the final maximum acceleration mode computed stop position for the pattern as the position at which the pattern would stop. During the constant maximum velocity mode of the commanded position signal, another computing mechanism indicates the predicted stop position. Each predicted stop position signal is compared to the signals for stops requested by registered calls for service and when a desired relationship between the predicted stop position signal and the call position signal exist the stop of the commanded pattern is initiated. Generation of a precise commanded position signal during the terminal portion of a run is enhanced by shifting from an initial position base for the signal to a final position base at a point in the signal generation when no discontinuity is encountered.

3,612,221
LIFT TRUCKLOAD CARRIAGE SAFETY DEVICE

George F. Branham, Chenango Forks, N.Y., assignor to The Raymond Corporation, Greene, N.Y.

Filed Sept. 4, 1969, Ser. No. 855,104
Int. Cl. B66b *5/16*
U.S. Cl. 187—84 10 Claims

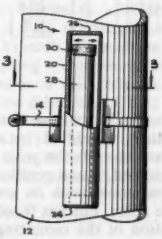


A pair of load carriage lifting chains are connected to opposite ends of a rocker arm pivotally connected on the load carriage so that the rocker arm is maintained in a reference pivot position during normal operation, but rotated on one direction or the other upon failure of one or the other of the chains. Rotation of the rocker arm in either direction from the reference position urges a stop means perpendicular to the plane of the truck mast structure to engage one of a plurality of cooperating stop means spaced vertically along the mast structure to half free fall of the load carriage. Spring means normally overcome by the torques applied to the rocker arm by the two chains rotates the rocker arm to translate the stop means if both chains break substantially simultaneously.

3,612,222
POLE DAMPING SYSTEM

Ray C. Minor, Abingdon, Va., assignor to Kearney-National Inc., New York, N.Y.

Filed Feb. 18, 1970, Ser. No. 12,359
Int. Cl. F16f *7/10*
U.S. Cl. 188—1 B 4 Claims



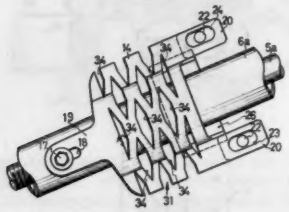
A pole damping system in which a hollow tubular member is attached to the wall of a hollow pole with an inertia mass in the form of a solid rod on the interior of the tube but unattached to the tube for limited movement on the interior of the tube for damping vibrations of the pole; in one embodiment the tubular member is mounted on the exterior of the pole but is mounted on the interior of the pole in another embodiment.

3,612,223

ENERGY-ABSORBING DEVICE

Masanao Shiomi, Toyota-shi, and Tadataka Narumi, Kariya-shi, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aochi-ken, Japan

Filed Dec. 5, 1969, Ser. No. 882,582
Claims priority, application Japan, Dec. 17, 1968, 43/92762
Int. Cl. F16f 7/12
U.S. Cl. 188—1 C 7 Claims



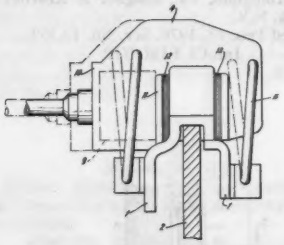
An energy-absorbing device having an elongated platelike member formed of a material having a high resistance to plastic deformation and provided with a plurality of spaced narrow slits whose edges lie in close or abutting relation, the slits lying in spaced lines perpendicular to the longitudinal direction of the plate, certain of said slits being closed at both ends and said slits being opened only upon application of an external force tending to elongate the plate, said member being fixed at one end through a force receiving member to a vehicle accessory, such as a bumper, and being fixed at the other end through a support member to the vehicle chassis.

3,612,224

DISK BRAKE CALIPER AND SUPPORTING STRUCTURE THEREFOR

Ulrich Walther, Bergneustadt, Germany, assignor to Dr. Hermann E. Muller Metallwarenfabrik Bergneustadt G.m.b.H., Cologne, Germany

Filed June 12, 1969, Ser. No. 832,615
Claims priority, application Austria, June 20, 1968, 5921/68
Int. Cl. F16d 55/224
U.S. Cl. 188—71.1 11 Claims



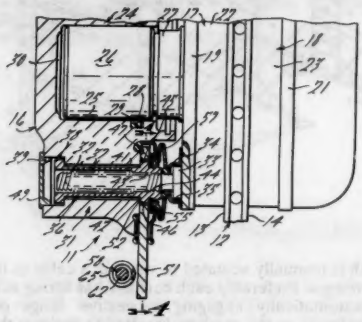
A disk brake has a rotor disk whose circumferentially extending margin is partially straddled by a U-shaped yoke. Resilient mounting means mounts the yoke in such a manner that it is permanently biassed to one position in which it freely straddles the marginal zones with its arms located at opposite axial sides of the rotor, but has freedom of movement against the biassing action of the mounting means both axially and circumferentially of the rotor. Friction means is arranged intermediate the respective arms of the yoke and the associated sides of the rotor, and actuating means is provided on one of the arms of the yoke and, when actuated, presses one of the friction means against one side of the rotor and thereby draws the yoke in opposite direction so that the other arm presses the other friction means against the other side of the rotor. When the operation of the actuating means is terminated, the yoke will return to its predetermined inoperative position under the biasing action of the resilient mounting means.

3,612,225

SELF-ADJUSTING DISK PARKING BRAKE

Anthony C. Evans, Westland, Mich., assignor to Kelsey-Hayes Company

Filed Oct. 8, 1969, Ser. No. 864,598
Int. Cl. F16d 55/16, 65/56
U.S. Cl. 188—72.6 9 Claims



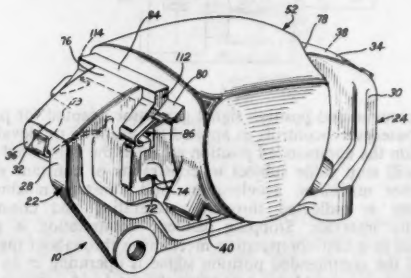
A disk brake assembly embodying a separate mechanical actuator for the primary brake pad. This mechanical actuator embodies a releasable screw-and-nut mechanism that is effective to accomplish an automatic adjustment of the at rest position of the brake pad.

3,612,226

CALIPER BRAKE HOUSING SUPPORT AND SHOE ANTIRATTLE SPRING

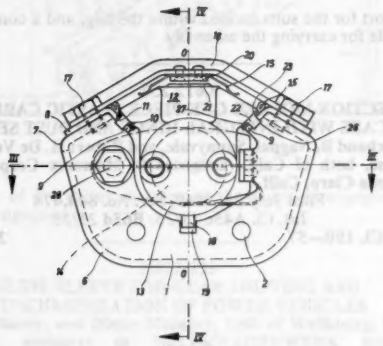
Maurice P. Pauwels, and Bert A. Gumkowski, both of South Bend, Ind., assignors to The Bendix Corporation

Filed Oct. 8, 1969, Ser. No. 864,779
Int. Cl. F16d 55/224
U.S. Cl. 188—73.3 2 Claims



A disc brake includes a caliper and a pair of friction elements slidably mounted on a U-shaped fixed support that straddles the rotor. A clip of resilient material interconnects the fixed support and the caliper for urging the caliper radially outwardly with respect to the rotor toward a pair of projections on the fixed support. The clip includes a pair of legs extending generally downwardly from the clip to engage the friction elements, thereby urging the latter toward the fixed support to prevent the shoes from rattling. The clip further includes a pair of upwardly extending arms engaging opposite ends of a removable key disposed between the caliper and one of the projections for retaining the key in the installed position.

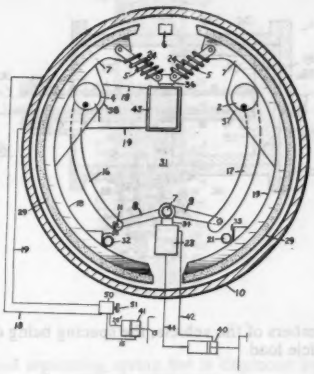
3,612,227
DISK BRAKE CONSTRUCTION
Erich Schaftner, Stuttgart-Zuffenhausen, Germany; Giorgio Eggstein, Ospedaletti, San Remo, Italy, and Heinz Ungerer, Stuttgart-Zuffenhausen, Germany, assignors to Ernst Heinkel Aktiengesellschaft, Stuttgart-Zuffenhausen, Germany
Filed Aug. 18, 1969, Ser. No. 850,955
Claims priority, application Austria, Aug. 16, 1968, 8A8044/68
Int. Cl. F16d 65/02
U.S. Cl. 188—73.3 7 Claims



A disk brake comprises a rotor disk mounted for rotation about a predetermined axis. A mounting element straddles a section of the periphery of the rotor disk and has at opposite sides of the same a pair of cutouts aligned axially of the rotor disk and each extending indirection inwardly of the periphery. The cutouts each have opposite side faces at opposite sides of the axis. A presser element for friction pads also straddles the section of the periphery and has portions located at opposite axial sides of the rotor disk, each of which extends into one of the cutouts. Yieldable-retaining means retains the presser element yieldable but with freedom of displacement both axially and radially outwardly relative to the rotor disk. Cooperating slide surfaces is provided on the portions of the presser element and on the side faces, respectively, for enabling sliding displacement of the presser element axially of the rotor disk. Anticontaminant means prevents the entry of contaminants between the respective slide surfaces.

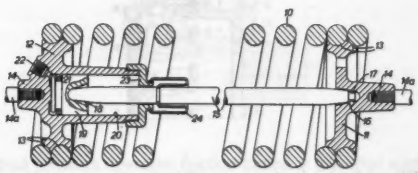
3,612,228
HYDRAULIC BRAKE AND PLURAL-ACTUATING MEANS THEREFOR
Frank G. Rick, 174 Gilfillan St., Franklin, Pa.
Filed Aug. 1, 1968, Ser. No. 846,764
Int. Cl. F16d 65/24
U.S. Cl. 188—106 P 2 Claims

This specification discloses a dynamic hydraulic brake for use in motor vehicles, heavy equipment, and aircraft. The invention consists of a parking brake, antitheft devices and an emergency brake. The invention is carried out by a double action brake master cylinder, a perma-set hydraulic flow valve with locking mechanism, a single action emergency master brake cylinder, two telescoping toggle links, springs,



stop block brake shoes and brake drum. An improved suspension for the brake shoes is provided.

3,612,229
VEHICLE BRAKING SYSTEMS
Richard Thomas Fowler, and Charles Newstead, both of Birmingham, England, assignors to Girling Limited
Filed Aug. 6, 1969, Ser. No. 847,951
Claims priority, application Great Britain, Nov. 5, 1968, 52,304/68
Int. Cl. F16d 65/24
U.S. Cl. 188—170 11 Claims

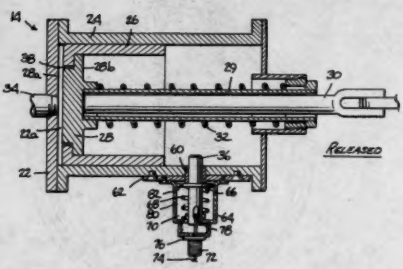


This invention relates to a vehicle drum brake actuator unit comprising a pair of elongate connecting members for attachment one to each of the drum brakes at opposite sides of the vehicle, spring means preferably in coil form for biasing each member in a direction along its length to tend to apply its respective drum brake, and a piston and cylinder assembly operable when fluid under pressure is applied thereto to prevent brake actuation and operable when the fluid pressure is released therefrom to allow the spring means to bias the members in said direction to actuate their respective drum brakes.

3,612,230
BRAKE MECHANISM FOR DIFFERENTIAL VEHICLE LOADINGS
Robert L. Ludington, Stop 34 Duneland Beach, Michigan City, Ind., and Robert M. Holloway, 921 North Roeske Trail, Pottawattomie, Michigan City, Ind.
Filed Jan. 7, 1970, Ser. No. 1,266
Int. Cl. B60t 8/18
U.S. Cl. 188—195 24 Claims

A fluid cylinder and piston and piston sleeve arrangement for providing different brake pressures with different vehicle

loads in which the piston sleeve is limited in its movement by means controlled in accordance with the spacing between a pair of members of the vehicle, the spacing being determined by the vehicle load.

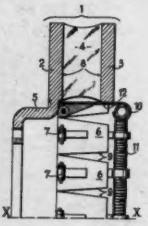


3,612,231

BRAKE HAVING A VENTILATED ROTOR

Jean-Marc Hauth, Pont-A-Mousson, France, assignor to Centre De Recherches De Pont-a-Mousson, Pont-a-Mousson, France

Filed June 5, 1970, Ser. No. 43,719
Claims priority, application France, Aug. 6, 1969, 69-26981
Int. Cl. F16d *65/84*
U.S. Cl. 188—264 A 5 Claims



Wheel brake having a ventilated rotor consisting of two discs defining radial air passages. One of the discs is fixed to a drum adapted to be secured to the wheel to be braked and a circular arrangement of plates pivoted to the drum is so arranged that the plates pivot in opposition to spring return means to a position in which they are applied against the inner periphery of the other disc so as to close the air passage as soon as a predetermined speed of rotation of the wheel is reached.

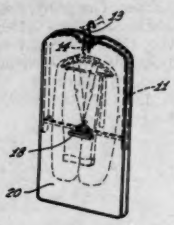
3,612,232

GARMENT CARRIER

William E. Larson, 3119 Southhampton Court #8, Richmond, Calif.

Continuation-in-part of application Ser. No. 651,179, July 5, 1967, now abandoned. This application Aug. 1, 1969, Ser. No. 861,530
Int. Cl. B65d *13/04*
U.S. Cl. 190—49 3 Claims

A garment carrier is provided which includes a frame and a specifically configured garment bag which extends over the frame, and in which one or more suits may be hung, each on its own hanger. A feature of the garment carrier is a transverse handle portion which extends across the bottom of the frame, to be grasped by the hand of the carrier, so as to enable the frame and garment bag conveniently to be tucked under the arm when it is carried. Therefore, the purpose of the frame is twofold, in that it serves to stiffen and support the garment bag, and in addition it provides a convenient support for the suits carried within the bag, and a convenient handle for carrying the assembly.

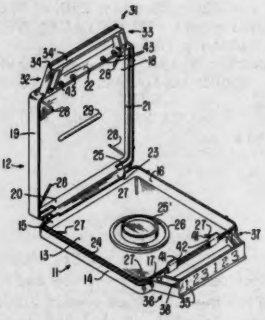


3,612,233

INJECTION-MOLDED ONE-PIECE PLASTIC CARRYING CASE WITH INTEGRAL HINGE AND DUST SEAL

Ramchand B. Nagpal, Sunnyvale, and Robert H. De Vore, San Jose, both of Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Filed July 24, 1969, Ser. No. 844,474
Int. Cl. A45c *13/26*; B65d *25/28*
U.S. Cl. 190—57 2 Claims



A plastic carrying case for magnetic tape reels made in one integral injection molded structure is described. The base and cover sections of the case are coupled by a flexible strip which serves as a hinge. The base is provided with a lip around its edge which mates with a recess around the edge of the cover to form a dust seal, the hinge strip overlapping the ends of the dust seal for additional sealing. Matching handle sections provide an extended surface area to accommodate printed matter. Internal ridges serve to prevent tape reels in the case from abrading the inner surfaces of the case and generating debris which might contaminate the tape. Flexible plastic straps extending from the base mate with lugs extending from the cover to latch the cover closed on the base.

3,612,234

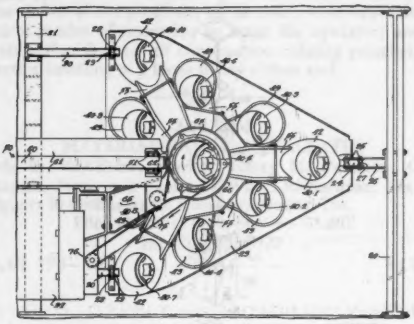
ONE-REVOLUTION CLUTCH

Alexander J. Albrecht, Franklin Lakes, N.J., assignor to Brunswick Corporation

Division of Ser. No. 719,801, Nov. 13, 1967, Pat. No. 3,499,648, which is a division of application Ser. No. 388,051, Aug. 7, 1964, now Patent No. 3,409,296, dated Nov. 5, 1968
Filed Feb. 25, 1970, Ser. No. 13,981
Int. Cl. F16d *71/00*
U.S. Cl. 192—28 4 Claims

A one-revolution clutch mechanism having a pivotal pawl on a driven member for selective engagement with a rotatable driver member as controlled by a pawl-engaging stop, and

power means effective when the pawl is adjacent the stop and operative to urge the driven member in the direction of rotation of the driver member at the point of engagement and disengagement.

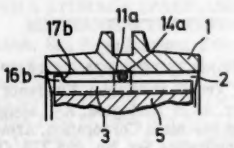


3,612,235

SLIDE SLEEVE FOR GEAR SHIFTING AND SYNCHRONIZATION OF POWER VEHICLES

Karl Ashauer, and Dieter Manthey, both of Wolfsburg, Germany, assignors to VOLKSWAGENWERK Aktiengesellschaft, Wolfsburg, Germany

Filed Dec. 9, 1969, Ser. No. 883,398
Claims priority, application Germany, Dec. 10, 1968, P 18 13 621.5
Int. Cl. F16d *23/06*
U.S. Cl. 192—53 F 1 Claim



A sliding sleeve for the gear shift and synchronizing devices of motor vehicles having a clutch gear with coupling teeth and a ring-shaped spring to encircle the teeth of the clutch gear.

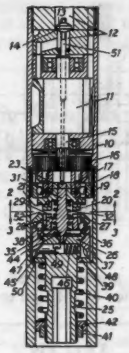
3,612,236

THREADED FASTENER-SETTING TOOL WITH TORQUE RELEASE MEANS

Gustaf Harry Fernstrom, Klinten, and Karl Ake Moberg, Tyreso, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed June 22, 1970, Ser. No. 48,083
Claims priority, application Sweden, June 27, 1969, 9186/69
Int. Cl. F16d *43/20*
U.S. Cl. 192—56 R 9 Claims

In the housing of a threaded fastener-setting tool with predetermined torque release, a motor rotates a driving clutch part and a rotatable tool spindle carrying a driven clutch part is movable in the housing from advanced to retracted position therein to bring the driving and driven clutch parts together into engagement for rotation of the tool spindle. During such engaging movement a separating spring is compressed between the clutch parts. At torque release the separating spring moves one of the clutch parts axially relative to the other and to the tool spindle to disengage the clutch parts while the tool spindle remains retracted. A bolt keeps normally said one clutch part poised therebetween and between said separating spring but is displaced by a torque responsive coupling to release disengagement.

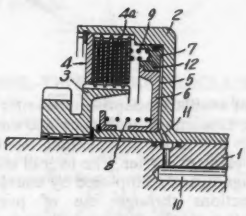


3,612,237

LIQUID PRESSURE-OPERATED FRICTIONAL CLUTCH APPARATUS

Soichiro Honda, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1969, Ser. No. 825,181
Claims priority, application Japan, May 16, 1968, 32521/68
Int. Cl. F16d *25/00*
U.S. Cl. 192—85 AA 3 Claims



A fluid pressure-operated friction clutch is provided with a piston operating within a pressure chamber and constituted by two piston members having respective return springs of different strengths so that the pressure chamber can be opened to the atmosphere through a small escape passageway by the advance movement of one piston member whereafter the passageway is closed by the relative movement of the other piston member, whereby the piston which is coupled to frictional clutch plates applies a weak initial force to engage the plates without shock and a subsequent strong force to fully engage the clutch plates.

3,612,238

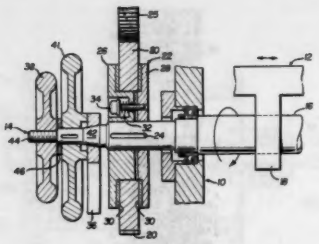
FEED CONTROL DEVICE

Edward M. Newsome, 25700 D'Hondt Court, Chesterfield Township, Mich.

Filed May 11, 1970, Ser. No. 35,957
Int. Cl. F16d *71/00*, *7/02*
U.S. Cl. 192—142 R 3 Claims

A clutch normally connects a driving wheel to a rotating drive shaft which controls the linear advance of a tool into a workpiece. The clutch is set to slip when the torque transmitted therethrough exceeds a predetermined limit, thereby ceasing advance of the tool while permitting the driving wheel to continue its rotation. The maximum advance of the tool is controlled by a stop arm which rotates with the drive shaft and which can be angularly adjusted thereon. Advance

of the tool continues until the stop arm engages a micrometer-type adjustable stop, at which point the torque applied to

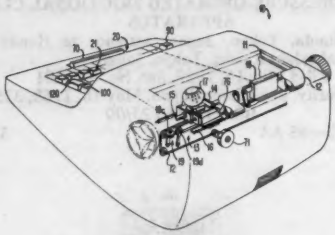


the clutch exceeds its predetermined capacity, causing the clutch to slip and advance of the tool to cease.

3,612,239
TYPEWRITER WITH ANCILLARY FUNCTION CONTROL

John O. Schaefer, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1969, Ser. No. 886,840
Int. Cl. B41j *23/02, 19/58*
U.S. Cl. 197—16 **17 Claims**

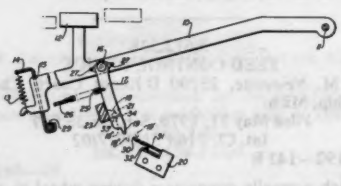


A plurality of ancillary nonprint typewriter functions such as word space, tabulation, backspace and carrier return are at least partially performed by operating members carried by a moving-type-element carrier. The overall mechanism of the typewriter is significantly simplified by enabling selection of individual functions through use of presently existing character selection mechanism in combination with a special nonprint mode selection control.

3,612,240
KEY-RESPONSIVE SWITCHING MECHANISM

Ralph L. Parker, Rockville, Conn., assignor to Litton Business System, Inc., New York, N.Y.

Filed Jan. 30, 1970, Ser. No. 7,169
Int. Cl. B41j *5/08*
U.S. Cl. 197—98 **14 Claims**



A code-generating keyboard mechanism wherein during downstrokes of control keys an element is pivotally deflected to store spring energy and then is freed suddenly for operation by the stored spring energy in a defined swinging path to effect one or a combination of switching operations for remote control of machine elements.

3,612,241
KEYBOARD SWITCH CONSTRUCTION

Victor M. Bernin, Mount Prospect, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

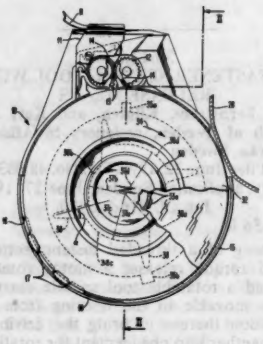
Filed Mar. 30, 1970, Ser. No. 23,639
Int. Cl. B41j *5/08*
U.S. Cl. 197—98 **11 Claims**

The disclosure describes solid-state keyboards employing a saturable magnetic core switch for each key. Each key has a keystem of magnetic material, the keystem having legs extending on opposing sides of the core. Two permanent magnets are attached to the keystem. When a key is not depressed, the magnets are located adjacent opposing sides of the core so that a flux path is formed through the core, the keystem, and the two magnets, to thereby saturate the core. When a key is depressed, the permanent magnets are moved away from the core so that it becomes unsaturated. The core is threaded by one or more wires, at least one of them being excited from an AC drive source. A switch housing of unitary construction is designed to guide the keystem, lock the switch in place in the keyboard, and hold the magnetic core in a position which facilitates threading wires through the cores.

3,612,242
AUTOMATIC RIBBON TAKEUP

John N. Cassell; Vencil D. Engle; Lawrence Hymes, and Donald C. Roller, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 495,774, Oct. 14, 1965, now abandoned. This application Feb. 1, 1968, Ser. No. 702,486
Int. Cl. B41j *33/14*
U.S. Cl. 197—151 **6 Claims**



Typewriter carbon ribbon is automatically attached to a takeup reel by the combined provision of: (1) a flexible

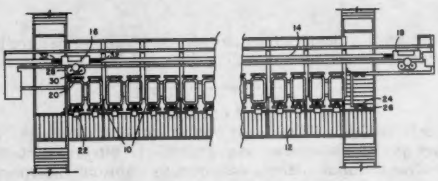
camming plate that creates significant friction interaction between the reel and the ribbon and is constructed to be effective even when substantial amounts of ribbon have been previously wound on the reel; (2) an electrically neutral flange to eliminate the adverse effects of static electricity on automatic attachment; (3) a reel enclosure for maintaining loose ribbon in the proximity of the reel; (4) several selective control modes of operation to assist the operator; and (5) several other features of construction relating principally to effective handling of a loose flimsy ribbon end.

3,612,243

MATERIAL HANDING APPARATUS

Lewis L. McAllister, Marion; Harry M. Passman, Cedar Rapids, Iowa, and James P. Wiles, Richardson, Tex., assignors to Collins Radio Company, Dallas, Tex.

Filed Mar. 23, 1970, Ser. No. 21,801
Int. Cl. B23q 5/22
U.S. Cl. 198—19 8 Claims



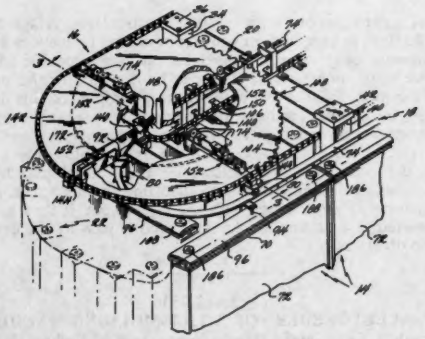
Material handling apparatus of the conveyor type especially suited for computer controlled operation. Mechanical features and electronic control features including safety precautions are described in a printed circuit processing application.

3,612,244

DISPLAY DEVICES MOVABLE THROUGH A DISPLAY SPACE AND A STORAGE SPACE AND CONVEYOR MECHANISM THEREFOR

Edward L. Raub, Sr., New London; Edward L. Raub, Jr., New London, Conn., and Richard P. Scholfield, Armonk, N.Y., assignors to New Concepts, Inc., Peekskill, N.Y.

Division of Ser. No. 607,702, Jan. 6, 1967, abandoned
Filed June 13, 1969, Ser. No. 832,998
Int. Cl. B65g 47/24, 47/32; G09f 11/30
U.S. Cl. 198—25 5 Claims



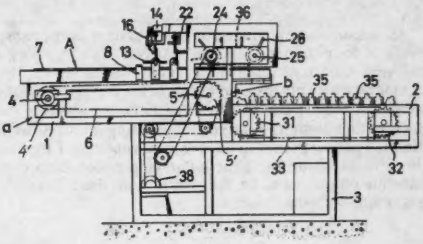
A conveying mechanism, for example, for moving each of a multiplicity of display devices through both a viewing area and a storage area. In the embodiment described herein, the mechanism includes a first and second sprocket wheel of different diameters mounted for rotation about a common axis at a common angular speed, first and second endless chains trained about the wheels and first and second drive means on the two chains for engaging a carrier assembly and moving it along the first chain at the speed of that chain and along the second chain at the speed of that chain.

3,612,245

APPARATUS FOR COORDINATING RANDOMLY PLACED EGGS RELATIVE TO A RECEIVING DEVICE

Hikoji Noguchi, No. 10-1251, Narahashi, Ooaza, Yamato-cho, Kitatamagun, Tokyo, Japan

Filed Dec. 5, 1969, Ser. No. 882,427
Int. Cl. B65g 47/24, 47/26
U.S. Cl. 198—33 4 Claims



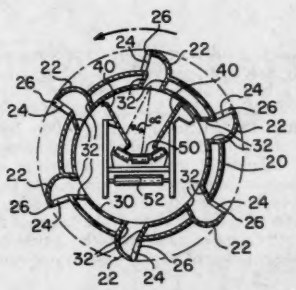
An automatic apparatus for use with an egg-accommodating or storage equipment, said apparatus being adapted for coordinating eggs randomly placed on the supply section of the apparatus relative to said accommodating or storage equipment in a positive and easy manner so that the eggs may be stored with shorter sides, viz, blunt sides upwards to retard the degradation of the eggs as much as possible during their prolonged storage.

3,612,246

BARREL-TYPE BUCKET RECLAIMER

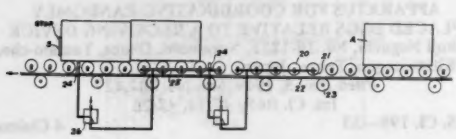
Paul Elze, Uffeln, and Wilhelm Schapsmeier, Holzhausen, Porta, both of Germany, assignors to Eisenwerk Weserhutte A.G., Mindener Strasse, Germany

Filed Mar. 21, 1969, Ser. No. 809,173
Claims priority, application Germany, Mar. 21, 1968, P 17 56 021.3
Int. Cl. B65g 59/00
U.S. Cl. 198—36 8 Claims



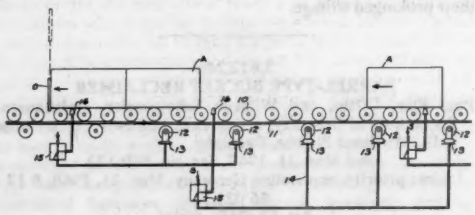
An outer tubular body means carries a plurality of buckets disposed in annular rows thereabout. An inner tubular body means is interconnected with the outer tubular body means by channel-defining means which define channels each of which extends at an angle to a radius of the body means extending through the center of a channel. A longitudinally extending conveyor means is disposed within the inner body means. Twin buckets may be mounted in pairs to operate in opposite directions of rotation of the body means, and these buckets may be tiltable about an axis extending parallel with the longitudinal axis of the body means. The buckets may also include a cutting means as well as a flexible backwall.

3,612,247
ACCUMULATING ROLLER CONVEYOR SYSTEM
Walter B. Pipp, Glen Ellyn, Ill., assignor to American Chain Cable Company, Inc., New York, N.Y.
Filed Aug. 1, 1969, Ser. No. 846,891
Int. Cl. B65g 43/08
U.S. Cl. 198—37 21 Claims



An accumulating roller conveyor system comprising a plurality of longitudinally spaced transversely extending article-carrying rollers which are yieldingly biased upwardly out of contact with a drivebelt. When articles engage the rollers, the weight of the articles forces the rollers downwardly into driving contact with the drivebelt. Sensing devices at longitudinally spaced points sense the interruption of movement of the articles along the article-carrying rollers and causes expansible chambers to be inflated to hold the rollers out of engagement with the drivebelt.

3,612,248
ACCUMULATING ROLLER CONVEYOR
Charles W. Wallis, Cary, Ill., assignor to American Chain & Cable Company, Inc., New York, N.Y.
Filed Aug. 1, 1969, Ser. No. 846,893
Int. Cl. B65g 43/08
U.S. Cl. 198—37 8 Claims



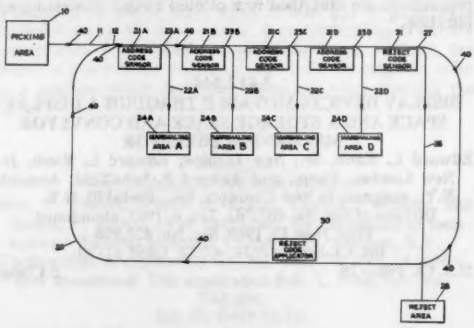
An accumulating roller conveyor comprising a plurality of longitudinally spaced transversely extending article-carrying rollers with a belt positioned beneath the rollers. Pressure rollers are normally held in position against the belt to hold the belt against the article-supporting rollers by expansible chambers to which fluid is supplied. A fluidic switch is provided along the path of the articles and when an article is stopped in position overlying the switch, the fluidic switch functions to deflate the expansible chamber permitting the pressure rollers to move away from the belt and thereby permitting the belt to move away from the article-carrying rollers so that the rotation of the article-carrying rollers is interrupted.

3,612,249
VERTICAL CONVEYOR TRANSFER MEANS
Erich Schneider, Wiesensteig, Germany, assignor to Organisation Ralfs K.G., Wiesensteig, Germany
Filed Mar. 9, 1970, Ser. No. 17,476
Claims priority, application Germany, May 31, 1969, P 19 27 888.7
Int. Cl. B65g 43/08
U.S. Cl. 198—38 8 Claims

A vertical conveyor formed by a plurality of serially arranged upward and downward runs. Switch means are located between successive runs for transferring articles from one direction to the other. The switch means are provided

with sensing devices for determining which articles are to be transferred and for controlling such transfer.

3,612,250
RECIRCULATION LIMIT SYSTEM FOR CONVEYORS
Gerald F. Thompson, and Francis J. Fitzgerald, both of Grand Rapids, Mich., assignors to Rapistan Incorporated, Grand Rapids, Mich.
Filed Apr. 6, 1970, Ser. No. 25,945
Int. Cl. B65g 43/00
U.S. Cl. 198—38 4 Claims

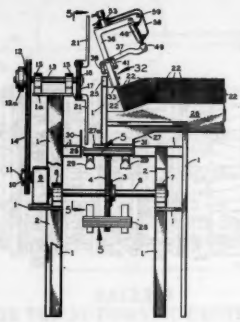


A recirculation limit system particularly adapted for utilization in conjunction with recirculating conveyors which, conventionally, recirculate articles carrying a specific address code until such time as they can be diverted to the proper destination. In accordance with the principles of this disclosure, the articles are permitted to recirculate past the various destination diversion gates two times and are then diverted to a reject area. This is accomplished by placing a reject code on the containers or articles after their initial pass by the destination diverters and then diverting them on to a reject conveyor in accordance with the reject code if they are not diverted to a destination on their second pass by the destination diverters.

3,612,251
PALLET FEEDER FOR A TILE-MOLDING MACHINE
Frank A. Gory, and Clarence Peavy, both of Hallandale, Fla., assignors to Gory Industries, Boca Raton, Fla.
Filed Sept. 24, 1969, Ser. No. 860,623
Int. Cl. B65g 15/14, 59/00
U.S. Cl. 198—76 7 Claims

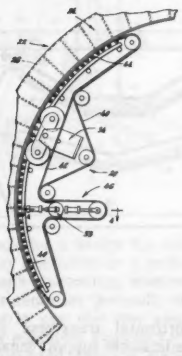
An automatic mechanism for feeding tile-molding pallets onto a conveyor of an automatic tile-molding machine in

predetermined precise sequential spaced relation from a stack of nested pallets positioned on a loading hopper in the mechanism including a power transmission driven by the



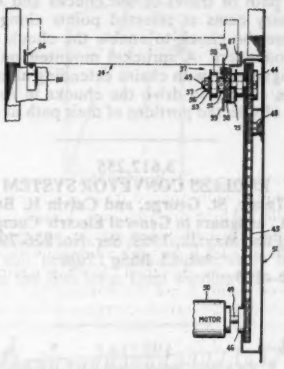
molding machine for operating the feeding mechanism including an independent electric controlled mechanism for sequentially releasing the pallets on the conveyor in timed relation with the conveyor.

3,612,252
CABLE TRAINED SEAL BELT
Aiting T. Yu, Kinneton, N.J., assignor to Hewitt-Robins Incorporated
Filed Jan. 9, 1970, Ser. No. 1,703
Int. Cl. B65g *37/00, 15/14*
U.S. Cl. 198—103 **3 Claims**



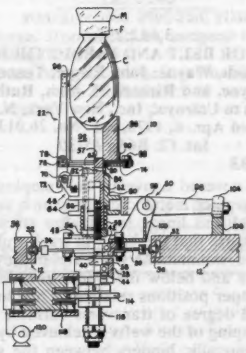
A rotatably mounted wheel, having a plurality of radially extending, open-ended peripheral storage cells therein for elevating material, employs a cable trained seal belt assembly which engages the inner annular surface of the wheel to seal the inner ends of the cells and maintain material within the storage cells during elevation. A conveyor belt, which transfers material to the storage cell, is wrapped part way about the outer peripheral surface of the wheel, driving the wheel which, in turn, drives the cable trained seal belt so that the linear speeds of cooperating wheel and belt sealing surfaces are the same or substantially the same. The cables of the seal belt assembly, which are located adjacent the lateral edges of the belt, maintain the seal belt in proper alignment with the wheel and the lateral edge portion of the seal belt in tight sealing contact with the inner sealing surfaces of the wheel for the entire length of the seal belt run.

3,612,253
RECESSED CHAIN-TRACK ASSEMBLY FOR DISHWASHERS
Roger L. Hoffman, Pequannock, N.J., and Gary Thomas Johnson, Chicago Heights, Ill., assignors to General Electric Company
Filed Feb. 17, 1969, Ser. No. 799,751
Int. Cl. B65g *19/02*
U.S. Cl. 198—173 **5 Claims**



A conveyor system for propelling dish racks on a pair of slide tracks through a dishwasher by means of lugs carried on a single, rearwardly disposed conveyor chain which rides on a separate chain rail positioned directly below the rearmost one of the aforesaid pair of slide tracks, the chain rail supporting the drive run of the conveyor chain on a top external surface thereof and the return run of the conveyor chain on a lower internal surface thereof, the lower internal surface of the chain rail being of a lesser width than the top external surface thereof thereby permitting the lugs on the return run of the chain to travel along the edge of the lower internal surface unobstructed, and means being associated with each of the aforesaid pair of slide tracks for tightening and locating the track assembly against the main body of the dishwasher while still permitting both of the slide tracks to be directly removed from the dishwasher with a minimum of effort.

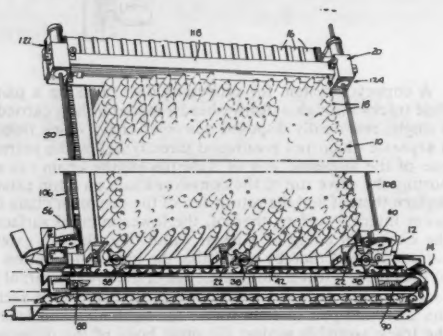
3,612,254
CONTAINER-HANDLING CHUCK
Luther H. Wideman, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Apr. 24, 1970, Ser. No. 31,555
Int. Cl. B65g *15/00*
U.S. Cl. 198—179 **13 Claims**



A chuck for handling and manipulating glass containers in a container production line. The chuck includes a container seat formed to receive and center the bottom of a glass con-

tainer between three or more symmetrically disposed clamping arms mounted upon the seat assembly to cooperate with the seat in holding the container in position on the chuck. The seat assembly is mounted for rotation in a chuck housing about an axis which is coincident with the axis of a container held on the seat. The housing is adapted to be carried upon an endless chain so that a series of chucks can be linked together in series and driven in succession past work stations at which various operations are performed on the containers. An operating lever carried by the housing projects to one side of the path of travel of the chucks and is engageable with stationary cams at selected points along the path to open or close the chuck to enable the chuck to receive or discharge containers. A sprocket mounted on the seat assembly is engageable with chains extending along the path of travel of the chucks to drive the chucks in rotation during their transit of selected portions of their path of movement.

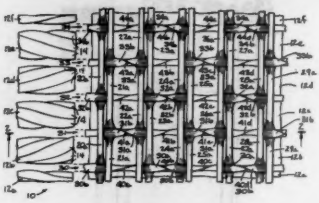
3,612,255
ENDLESS CONVEYOR SYSTEM
Douglas P. Tassie, St. George, and Calvin H. Baxter, Milton, both of Vt., assignors to General Electric Company
Filed May 22, 1969, Ser. No. 826,796
Int. Cl. B65g *17/00*
U.S. Cl. 198—189 **12 Claims**



An endless conveyor system includes a train of links, each link being coupled to its next adjacent link by a pivot member, the distance between the center lines of immediately adjacent pivot members being fixed, the pivot members being guided between the distal pairs of mutually confronting guide surfaces but not guided between the distal ends of the pair of guide surfaces, i.e., the turnarounds, the distance between the centerlines of the pairs of guide surfaces being the same as the distance between the center lines of the pivot members, and both runs being engaged by the driving means.

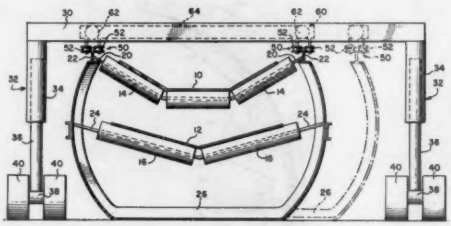
3,612,256
CONVEYOR BELT AND FABRIC THEREFOR
George R. Limbach, Wayne; John Rieger, Teaneck; Martin F. Sheridan, Wayne, and Richard H. Voss, Rutherford, all of N.J., assignors to Uniroyal, Inc., New York, N.Y.
Filed Apr. 6, 1970, Ser. No. 26,013
Int. Cl. B65g *15/30*
U.S. Cl. 198—193 **20 Claims**

An elastomer-covered conveyor belt employing a belting fabric having warps of metallic cables which are maintained coplanar, parallel and linear to equalize stress distribution therein and to insure that the belt will track truly. Selectively inwardly crimped, nonmetallic wefts are employed in respective layers above and below the warps in order to maintain the warps in proper positions relative to one another and to impart a desired degree of transverse stiffness to the fabric. The inward crimping of the wefts is achieved by positioning a plurality of nonmetallic binders between the warps in each pair of adjacent warps and selectively interlacing the binders with the upper and lower wefts. The binders between adjacent warps cross one another and form intersection points which abut against the warps and assist in maintaining the warps in proper position relative to one another. The belting fabric is preferably dipped in a resorcinol formaldehyde latex solution after weaving and then heat treated to remove the volatile components of such solution and shrink the nonmetallic weft and binder strands therein.



The foregoing abstract is neither intended to define the invention disclosed in this specification, nor is it intended to be limiting as to the scope of the invention in any way.

3,612,257
EQUIPMENT FOR SHIFTING BELT CONVEYOR LINES
Hans Goergen, Weiden/Cologne, and Hans Hupp, Bruhl, Cologne, both of Germany, assignors to Eisenwerk Weserhutte A. G., Bad Oeynhause, Germany
Filed Apr. 14, 1969, Ser. No. 815,560
Claims priority, application Germany, Apr. 13, 1968, E 26816
Int. Cl. B65g *15/60*
U.S. Cl. 198—204 **4 Claims**

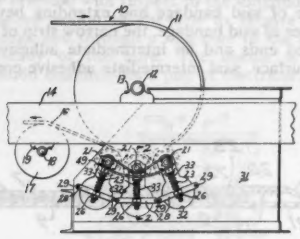


A generally horizontal transverse support means has generally vertical adjustable support means connected to opposite ends thereof, these vertical support means being adjustable in a vertical direction and including wheel means at the lower ends thereof adapted to move along a supporting surface. An associated conveyor has shifter rails at the upper part thereof, and conveyor-engaging means includes antifriction rollers engageable with these shifter rails. Lateral shifting means is provided for shifting the conveyor line engaging means laterally to thereby laterally shift the associated conveyor line.

3,612,258
BELT CLEANER
Wilbur W. Bagby, 105 Conover Drive, Birmingham, Ala.
Filed Oct. 27, 1969, Ser. No. 869,482
Int. Cl. B65g *45/00*; **F16h** *57/04*
U.S. Cl. 198—230 **5 Claims**

Endless belt cleaning unit having cylinder with plurality of angularly spaced, abrasion-resistant, resilient rods extending

parallel to each other and in spaced relation to the outer surface of cylinder. Annular flanges carried by ends of cylinder



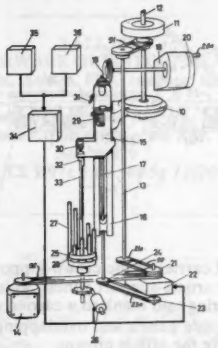
retain rods in position to contact return flight of belt to impart rotation to cylinder and rods carried thereby.

3,612,259

DEVICE FOR THE AUTOMATIC CENTRAL FORMAT SETTING IN A COMPOSING AND LINECASTING MACHINE

Karl Debus, Bad Homburg, Germany, assignor to Linotype GmbH, Frankfurt am Main, Germany

Filed May 9, 1968, Ser. No. 728,030
Claims priority, application Germany, May 11, 1967, L 56,484
Int. Cl. B41b *9/06*
U.S. Cl. 199—18 **5 Claims**



The invention includes a device for automatically setting, in response to a key operation or a perforated control tape signal, the line length controlling elements of a linecasting machine. These elements are generally the assembler slide, the particular mold in use, the vise jaws, the slug ejection mechanism, and, in machines equipped with a saw, the saw. When the saw is provided, there is no need to change the mold in use or to alter the ejection mechanism.

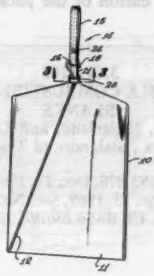
3,612,260

OVER-THE-SHOULDER GARMENT CARRIER

Robert A. Brilhart, 315 3rd St., Huntington Beach, Calif.

Filed May 20, 1970, Ser. No. 38,932
Int. Cl. A45c *7/00*
U.S. Cl. 206—7 H **6 Claims**

The disclosure describes an over-the-shoulder garment carrier comprising a garment bag, a flexible handle comprising an elongated loop and an end portion or linking piece which is secured to said garment bag, the flexible handle carrying a first loop adapted for carrying the hook end portion of a conventional suit hanger, such that the weight of the garments are supported primarily by the first loop rather than by the end portion of the flexible handle, said flexible handle additionally carrying a lock strap, said lock strap having a first end portion secured to the flexible handle at a point between the first loop and the garment bag such that the lock strap, when formed into a second loop, extends generally at a right angle to the longitudinal dimension of the flexible handle



whereby the second loop prevents the hook end portion of a conventional suit hanger, which inadvertently has become detached from the first loop, from slipping into the garment bag.

3,612,261

GOLF TEE HOLDING MEANS

Edward L. Cicero, 52-62 66th St., Maspeth, N.Y.

Filed Oct. 28, 1969, Ser. No. 870,034
Int. Cl. A45c *11/00*
U.S. Cl. 206—37 R **10 Claims**

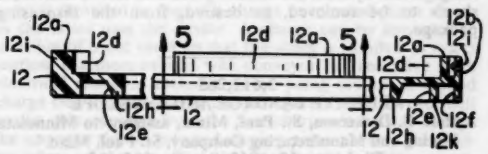
For the containment and organization of golf tees a holding means may be used to hold nine or 18 tees so that they will be readily available for use during a golf game and to provide a relatively flat packet of tees from which the latter may be selectively removed or replaced. The packet protects the player from the sharp ends of the tees as they are carried around during the game and keeps the tees in one place for ready use.

3,612,262

PACKAGING PROTECTOR

David J. Freiman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 11, 1970, Ser. No. 18,467
Int. Cl. B65d *85/00*
U.S. Cl. 206—46 FR **10 Claims**



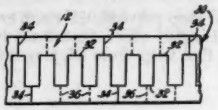
A packaging protector comprising an annular divider member or partition of resilient material, such as

polyethylene, for nesting within a frangible dish-shaped or bowllike piece of ware a separate complementing and frangible cover in an impact-absorbing or cushioned spaced-apart relationship with the piece of ware as well as providing for impact absorbing or cushioning between the walls of a package and the rims of the piece of ware and its associated cover packed in the carton of the package for shipping or storage purposes.

3,612,263
STRIP OF SEPARABLE COMBUSTIBLE INSERT SLEEVE BLANKS

Clarence M. Doering, Nederland, and Leonard S. Seni, Port Arthur, both of Tex., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 693,878, Dec. 27, 1967, Pat. No. 3,495,924
Filed Apr. 13, 1969, Ser. No. 834,575
Int. Cl. B65d *69/00, 3/24*
U.S. Cl. 206—56 AB 1 Claim

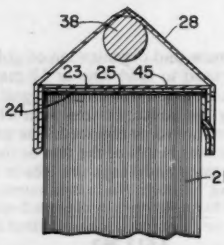


A strip of separable combustible insert sleeve blanks for use in a solid fuel heater container, the insert sleeve having supporting legs for predetermined positioning with respect to the fuel in the heater container.

3,612,264
SHEET MATERIAL DISPENSER PACKAGE

Robert E. Trunick, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 11, 1969, Ser. No. 848,775
Int. Cl. B65d *85/04*
U.S. Cl. 206—57 15 Claims



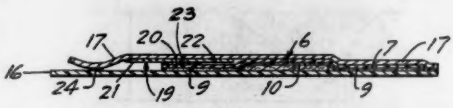
A dispensing package for sheeted materials such as towels, napkins, and tissues in which a stack of the sheeted materials is adhesively fastened along one end to a header piece, each sheet being connected to the header. Flexible extensions attached to the header piece are adapted to form a hanging support so as to permit the package to be hung from a support rod such as a bathroom towel bar. The sheeted material hangs vertically from the header piece and allows individual sheets to be removed, as desired, from the dispensing package.

3,612,265
ADHESIVE BANDAGE AND ENVELOPE

Arthur C. Dickerson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 10, 1969, Ser. No. 805,428
Int. Cl. A61b *19/02*
U.S. Cl. 206—63.2 3 Claims

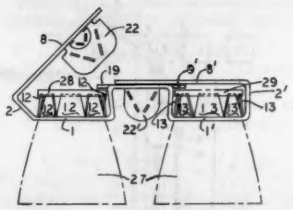
A packaged adhesive bandage comprising an adhesive bandage and an envelope therefor, said bandage including a backing strip having a tacky adhesive coating on one surface thereof with a dressing pad adhered to the backing strip generally centrally of said one surface, a first package panel having a low adhesion surface contacting said adhesive-coated surface of said bandage and extending beyond the peripheral edges of said bandage, the narrow strip of material having opposed ends and an intermediate adhesive-coated area on one surface, said intermediate adhesive-coated surface being placed in contact with the surface of said backing strip opposite the said one surface coated with said tacky adhesive, said opposed ends of said strip of material lying parallel with said backing strip, and a second package panel overlying said adhesive bandage and said strip of material and extending beyond the peripheral edge portions of said bandage and being secured to said first package panel.



3,612,266
CROWN-SUPPORT CARRIER

Earl J. Graser, Monroe, La., assignor to Olinkraft, Inc.

Filed Nov. 6, 1969, Ser. No. 874,429
Int. Cl. B65d *71/00*; B66f *19/00*
U.S. Cl. 206—65 E 9 Claims



An improved carrier of the crown-support variety comprising at least two article-support panels, which panels comprise means for securing said blank to a carried article. The carrier also comprises side panels and overlapping top panels which are locked above the article crowns.

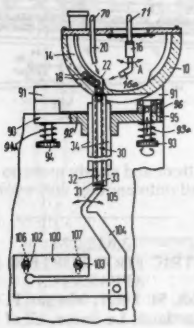
3,612,267
TESTING AND SORTING APPARATUS FOR RING-SHAPED ELEMENTS

Werner Eckert; Heinrich Rothmann; Heinz Scheibe, and Karl Beer, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 13, 1970, Ser. No. 19,287
Claims priority, application Germany, Mar. 18, 1969, P 19 13 680.2
Int. Cl. B07c *1/04*
U.S. Cl. 209—73 24 Claims

Apparatus for measuring the electrical and/or magnetic properties of electrical constructional elements, particularly ferromagnetic ring cores, includes a guide for conveying the elements one at a time for testing. The guide includes a longitudinal slot having cross-sectional dimensions slightly greater than the diameter and thickness of an element to be tested and the guide is constructed of a material that is highly wear resistant, electrically insulating and possesses excellent sliding frictional properties. The guide is preferably constructed of a precious stone, such as sapphire, or from a hard or finely porous ceramic material. The guide is connected in a thick-disconnect manner to a supply container with the slot thereof in communication with a feed trough for the elements to be tested. The supply container is provided with a

plurality of inner jets and internal sloping surfaces of the trough to present the elements one at a time into the slot of the guide. The guide includes a bore therethrough perpendicularly oriented with respect to the longitudinal dimension of the cross section of the slot to receive a test needle therethrough and through a ring core of the like positioned concentrically of the bore. The needle is mounted for reciprocation and includes a pair of electrical members insu-



lated one from the other and contacting test apparatus upon each insertion action of the reciprocation. One member of the needle is of greater electrical capacity than the other in that it is to be included in a higher electrical loading circuit as a primary winding for the element under test while the other member is in a lesser electrical capacity in a secondary circuit for the test element.

3,612,268

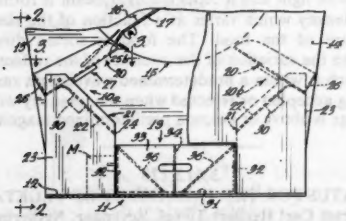
SILVERWARE ORIENTING MEANS

Aldrich L. Jackson, Eustis, Fla., assignor to Dynasort Corporation

Continuation-in-part of application Ser. No. 707,164, Feb. 21, 1968, now abandoned. This application Apr. 15, 1970, Ser. No. 28,879

Int. Cl. B07c *5/06;* **B65g** *11/20*

U.S. Cl. 209—73 **36 Claims**



Apparatus for receiving and orienting randomly arranged pieces of silverware, and for discharging the silverware to a storage means with all the handles of the silverware at one end. The silverware receiving and orienting structure is associated with a machine that separates forks, knives, teaspoons and soupspoons; and a movable, multicompartmented storage structure is associated with the apparatus, so that each type of silverware can be discharged in oriented fashion into a single compartment.

3,612,269

SHUFFLE FEED MECHANISM

Earl R. Anderson, Los Gatos, Calif., assignor to Brex Corp., trustee, Los Gatos, Calif.

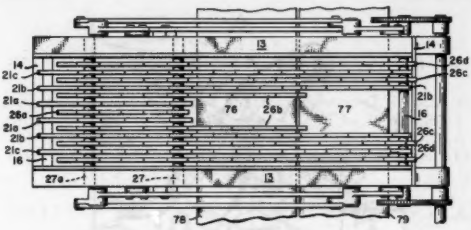
Division of Ser. No. 776,682, Nov. 18, 1968

Filed Aug. 27, 1970, Ser. No. 67,317

Int. Cl. B07c *5/04*

U.S. Cl. 209—73 **5 Claims**

This mechanism comprises a shuffle feed mechanism having two sets of longitudinally extending serrated members forming a grid or bed, at least one of the sets being movable longitudinally with respect to the other so as to progress articles from pocket-to-pocket or valley to valley along the length of the mechanism by pushing of the articles upwardly along an inclined wall of a V-shaped notch and over the apex so as to slide or roll down into the next notch.



The spaces or slots between adjacent longitudinally extending members may be used as sorting openings either for small debris fed along with the articles being progressed or to provide different sizes or grades of the articles.

Also this type of shuffle feed may be used as an open grid work for the passage of upwardly directed air blasts to separate light articles of debris from the articles being progressed.

3,612,270

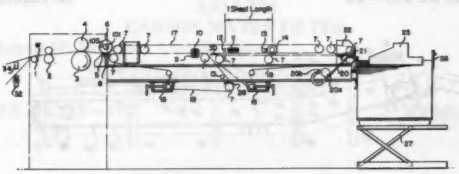
CUTTER PILER WITH ELECTROSTATIC LAYBOY

Waldyn J. Benbenek, Lee; Frank A. Grosso, Pittsfield, and James G. Wellspeak, Lee, all of Mass., assignors to The Clark-Aiken Company, Lee, Mass.

Filed June 16, 1969, Ser. No. 833,592

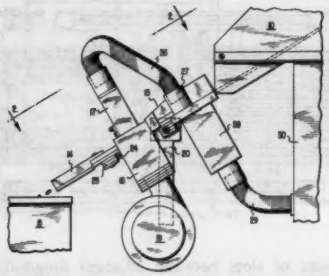
Int. Cl. B07c *5/344*

U.S. Cl. 209—74 **10 Claims**



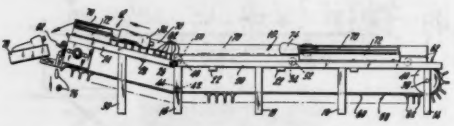
A paper-handling machine with slitters and a rotary knife cutter for cutting traveling webs of papers has opposing conveyor belts to move sheets of paper downstream from the cutter to a collection area. A reject section is located upstream of the piling section and conveyors are positioned to move the cut sheets to either the piling section or the reject section responsive to a signal received from a sensing device or other switch. Either the reject section and/or the piling section includes a conveyor capable of attracting and holding a cut sheet of paper properly charged with static electricity. Each cut sheet of paper has an electrical charge imparted to it by an electrical charge element positioned adjacent a conveyor belt downstream from the rotary knife. A charge element is signalled to impart a charge to selected paper sheets as the latter pass the device. A charge can be imparted to one side of a cut sheet so that the sheet is shunted to reject section. If a sheet overlap with conveyor belt receptive to an electrical charge is included in the piling section, a second charge element can also be placed adjacent the conveyor belt on the side opposite from the first charge element to charge the opposite side of selected moving paper sheets. The leading edges of the cut sheets being moved to overlap are attracted upwardly to the overhead conveyor and thereafter slowed down and moved over the trailing edges of preceding sheets so that succeeding sheets overlap one another. A static eliminator device is positioned to neutralize the charges imparted to the sheets as they are collected.

3,612,271
PNEUMATIC CAPSULE SEPARATOR
Richard C. Behling, Goshen, N.Y., assignor to Geigy Chemical Corporation, Greenburgh, N.Y.
Filed Aug. 28, 1969, Ser. No. 853,808
Int. Cl. B07b *13/10*
U.S. Cl. 209—74 8 Claims



A mass of identical capsules disposed in a single layer and each containing a charge of medicament flows by gravity down an inclined chute. Each capsule is intended to contain a prescribed standard amount of medicament which, by weight and composition, is identical to the charges in all the other capsules. Incompletely charged capsules, being lighter than the others, are blown out of the layer by a stream of air which deposits them in a collection chamber from which they are removed by suction to a point of discharge.

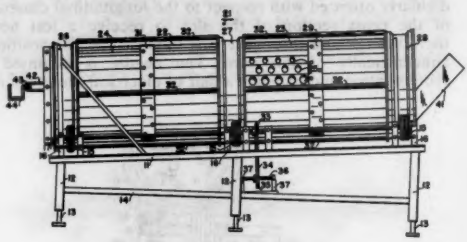
3,612,272
SEPARATOR-CONVEYOR
Samuel S. Aidlin, 214 Beaumont St., and Stephen H. Aidlin, 3855 Shore Parkway, both of Brooklyn, N.Y.
Filed Mar. 9, 1970, Ser. No. 17,665
Int. Cl. B07b *13/04*
U.S. Cl. 209—92 10 Claims



A separator-conveyor for the products of molding or casting or like apparatus, including the produced articles and the associated scrap, in which one of the two items is of larger size than the other, consisting of an endless conveyor belt mounted below the outlet of the molding apparatus, and provided with a continuous row of transversely disposed cleats along its center; spaced a distance sufficient to accommodate between them the smaller of the two items but insufficient to accommodate the larger of the items; the latter resting on top of the cleats. Guards are provided for retaining the items between the cleats and the items on top of the cleats in position while moved by the conveyor belt.

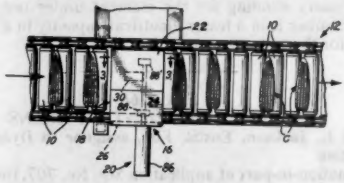
3,612,273
SEPARATOR
Wallace R. Pritchett, 11340 S. W. 208th Drive, Miami, Fla.
Filed Apr. 21, 1969, Ser. No. 817,699
Int. Cl. B07c *3/04*
U.S. Cl. 209—95 5 Claims

A cylindrical separator comprises a cylinder formed of any suitable material with openings formed in its interior wall. The openings determine the threshold size of the items being separated. Items are inserted into one end of the cylinder which is mounted on an angle with the horizontal and is rotated. Those items which are smaller than the diameter of the openings in the interior wall of the cylinder are carried upwardly by its rotation and are discharged at the top onto a conveyor which carries them away. Those items which are larger than the diameter of the openings remain in the



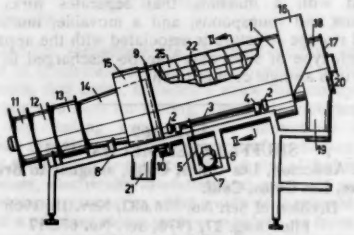
cylinder at the bottom and slowly move to the low end where they are discharged onto another conveyor.

3,612,274
PHOTOELECTRIC FOOD SORTING METHOD AND APPARATUS
Edward D. Schmidt, St. Peter; Morgan P. Camery, Le Sueur, and John G. Martland, Le Sueur, all of Minn., assignors to Green Giant Co.
Filed Apr. 21, 1969, Ser. No. 817,641
Int. Cl. B07c *5/342*
U.S. Cl. 209—111.6 10 Claims



Food sorting of foods which display only minimal color variation between the grades which are to be distinguished from each other are sorted by simultaneously sensing more than one of the characteristics of the food. The food is illuminated with light and a reflected light beam is formed having an intensity which varies as a function of the size, color and texture of the food. The food is sorted directly in response to the variation of the intensity of the reflected light beam which is within a predetermined wavelength range, the food being accepted or rejected when the intensity within the given range is above or below a predetermined magnitude.

3,612,275
APPARATUS FOR THE TREATMENT OF VEGETABLES
Robert Ernst Carl Herbert Tiepel, Zevenaar, Netherlands, assignor to Lever Brothers Company, New York, N.Y.
Filed Oct. 15, 1968, Ser. No. 767,656
Int. Cl. B07b *5/00*
U.S. Cl. 209—152 7 Claims



An apparatus for removing extraneous vegetable matter from vegetable products such as Brussels sprouts comprising

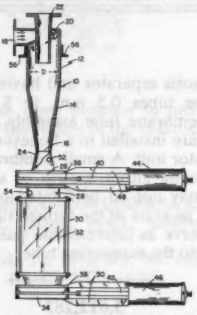
an inclined rotary drum having an internal arrangement which allows the products to be subjected to an airstream a number of times during their passage through the drum.

3,612,276

VORTEX-TYPE SEPARATOR APPARATUS

Thomas William Lowe, Needham, Mass., assignor to Bird Machine Company, South Walpole, Mass.

Filed Apr. 29, 1969, Ser. No. 820,261
Int. Cl. B04c 5/081, 5/14
U.S. Cl. 209—211 5 Claims



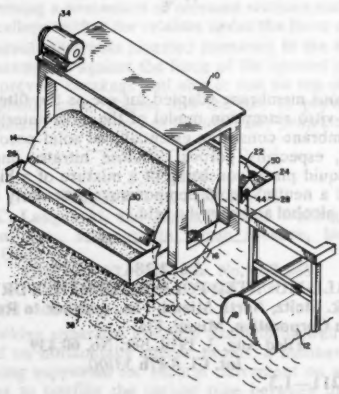
A vortex separator is provided which is substantially more efficient than prior separators in cleaning fiber slurry at concentrations of 3 percent and above of impurities which will pass a ¾-inch hole screen, the separator and its connections to a sump having specified design parameters and features some of which are critical for obtaining such efficiency and others of which are preferred for maximizing it.

3,612,277

METHOD OF RECOVERING OIL FROM AN OIL SLICK

Merle H. Van Stavern; Wylie T. Jones; Howard F. Cossey, and Wendall J. Clark, all of Richmond, Va., assignors to Texaco Inc., New York, N.Y.

Filed June 15, 1970, Ser. No. 46,057
Int. Cl. B01d 17/02
U.S. Cl. 210—83 2 Claims



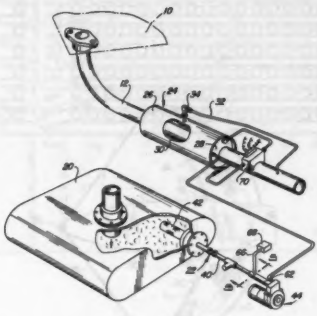
A rotatable drum type of oil skimmer which is continually rotated to pick up a film of oil and water on the surface of the drum, having a supplemental or transfer drum located substantially above the oil slick and well out of contact therewith, so as to come into contact with film on the pickup drum and receive a portion of the film, product oil being recovered from both drums.

3,612,278

WASTE TREATMENT AND DISPOSAL SYSTEM

Melvin L. Dieterich, North Olmsted, Ohio, assignor to The Standard Products Company, Cleveland, Ohio

Filed Nov. 3, 1969, Ser. No. 873,251
Int. Cl. B01d 1/14; C02b 1/18
U.S. Cl. 210—152 1 Claim



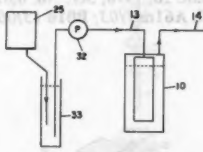
A fluid treatment system in which a peristaltic pump employs concentric tubes to define separate flow paths for the treating agent and the material to be treated. In this manner, a single pump may be used to pump both fluids. The flow paths may merge either interior or exterior of the pump whereby a metered amount of treating agent is mixed with the fluid. A specific application is in waste disposal system in which deodorants or antifoaming agents are added to the waste products prior to final disposal.

3,612,279

CARBON WATER FILTER

Ernest W. Hostetter, Lincoln, Iowa

Filed Nov. 21, 1969, Ser. No. 878,693
Int. Cl. B01d 35/02, 29/24
U.S. Cl. 210—170 6 Claims



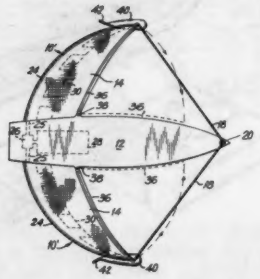
A filter for liquid, including well water, comprised of four large tubes, plugged at their ends and suspended vertically as a unit within a tank. The liquid is introduced into the tank in such a manner as to be sprayed in diverse directions near the tank's bottom to assure even circulation. The circulation is through circumferential slots or perforations in the tubes, but the liquid must first pass through a filter cloth wrapped around each tube, this cloth being coated with a mixture of activated powdered carbon, diatomaceous earth, and fiber. During this flow through the mixture, the filter cloth, and into the tubes through the slots or perforations, the taste of chlorine, rust, sediment, or any other undesirable substance is removed from the liquid. The tubes are connected with each other at their tops, from which connection is an outlet for the liquid.

3,612,280

OIL-SKIMMING APPARATUS

Hugh J. Fitzgerald, Austin, and Ernest H. Koepf, Dallas, both of Tex., assignors to Ocean Pollution Control, Inc., Dallas, Tex.

Filed Jan. 21, 1970, Ser. No. 4,602
Int. Cl. B01d *21/18*
U.S. Cl. 210—242 9 Claims



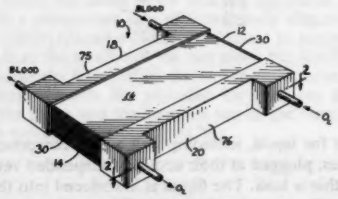
A pair of wing assemblies attached to opposite sides of the hull of a marine vessel, each including a cover with tensioning means engaging its outer end to keep it extended outwardly, means to support its leading edge above the water to allow oily material at the surface to pass beneath it, an angled skirt portion at its trailing edge to funnel the oily material inwardly toward the vessel, conduits at the hull of the vessel to remove the oil, and lines engaging the outer ends of the wing members for hauling them inwardly to clear lateral obstructions.

3,612,281

PARALLEL MEMBRANOUS LAYER TYPE FLUID DIFFUSION CELL

Ronald James Leonard, Elk Grove Village, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Division of Ser. No. 712,066, Mar. 11, 1968, Pat. No. 3,560,340
Filed Jan. 26, 1970, Ser. No. 6,015
Int. Cl. A61m *1/03*; B01d *13/00*
U.S. Cl. 210—321 14 Claims



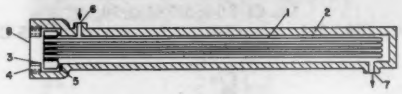
A fluid diffusion cell having a diffusion membrane folded to define a first set and a second set of oppositely opening pockets. Each pocket in both sets contains a support member, and a pair of manifolds are provided to provide a fluid inlet and outlet at opposite ends of each of said sets of pockets to permit fluid to pass from each inlet into one end of each of the pockets of one set, to pass through each of the pockets and the outlet.

3,612,282

SUPPORTING STRUCTURES AND CONTAINING VESSELS FOR REVERSE OSMOSIS AND FILTRATION

Sing-Wang Cheng, c/o Dr. Chen-Yen Cheng 3555 E. Evans Ave., Denver, Colo.

Filed Aug. 14, 1969, Ser. No. 850,135
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 11 Claims



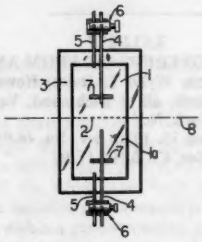
A reverse osmosis separator unit having many small composite membrane tubes 0.5 mm. to 5 mm. O.D. placed together in a membrane tube assembly. Several membrane tube assemblies are installed in a honeycomb pressure vessel to form a separator unit. A small membrane supporting tube is made by forming either a strip of solid sheet material which may or may not be perforated or a strip of porous sheet material. The seam of the formed tube, the perforations and the pores serve as intermediate passages for collecting product water into the supporting tube.

3,612,283

MEMBRANE FOR AN IN-VITRO RESORPTION MODEL OF THE GASTROINTESTINAL TRACT

Herbert Stricker, Ingelheim/Rhine, Germany, assignor to C. H. Boehringer Sohn, Ingelheim/Rhine, Germany

Filed Sept. 29, 1969, Ser. No. 861,777
Int. Cl. B01d *39/14, 31/00*
U.S. Cl. 210—490 5 Claims



A porous membrane adapted for use as the filter element in an in-vitro resorption model of the gastrointestinal tract, said membrane consisting essentially of solid porous carrier material, especially porous cellulose nitrate, impregnated with a liquid phase consisting of a mixture of a higher fatty acid and a neutral lipoid component, particularly a mixture of lauryl alcohol and caprylic acid.

3,612,284

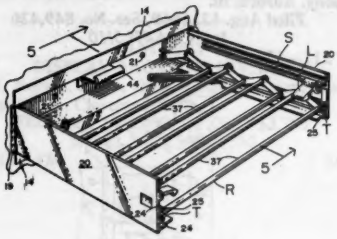
WALL-MOUNTED FOLDING CLOTHES DRYER

George R. Stoltz, North Miami, Fla., assignor to Russell Aluminum Corporation, Miami, Fla.

Filed Aug. 3, 1970, Ser. No. 60,439
Int. Cl. A47b *53/00*
U.S. Cl. 211—1.3 3 Claims

A wall-mounted folding clothes dryer adapted to be mounted flush with a bathroom wall having a boxlike receptacle enclosed by a pair of doors on whose inner sidewalls and doors are a pair of spaced flanges forming opposed trackways that are aligned but spaced from each other to permit closing of the doors. A collapsible frame is formed by horizontal rods joined together by pivot links with rollers secured to the ends of the rods and rotatably mounted in the

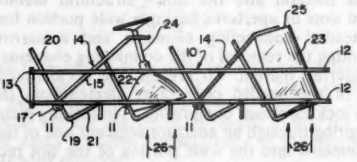
trackways. Hinge elements are provided with a portion that swings into the aforementioned gap between the tracks when the doors are in the open position to provide an uninterrupted trackway for the rollers of the collapsible frame.



3,612,285
DISHWASHER DISHRACK

Anthony Mason, St. Joseph, Mich., assignor to Whirlpool Corporation

Filed Feb. 16, 1970, Ser. No. 11,480
Int. Cl. A47g *19/08*
U.S. Cl. 211—41 **7 Claims**



A dishwasher dishrack for holding articles during the washing operation which is of open construction to receive upwardly projected sprays of washing liquid in which the dishrack comprises an article-holding basket and a pivotally mounted retainer therein having spaced-apart sides and a crossbar connecting these sides at their outer ends, the crossbar comprising a succession of recessed sections such as successive scallops so that the retainer under the force of gravity acting thereon embraces inverted stemware in the basket to hold the stemware against the force of the upward projected liquid to prevent breakage and also to rest on top of articles such as plastic cups, glasses and the like to prevent their being displaced by the force of the upwardly projected liquid.

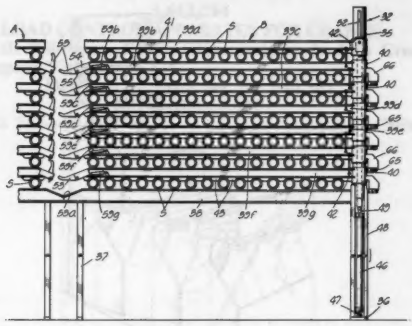
3,612,286
HORIZONTAL PIPE RACK

Faustyn C. Langowski, and James Bernard Walling, both of Houston, Tex., assignors to Byron Jackson, Inc., Long Beach, Calif.

Filed Oct. 22, 1969, Ser. No. 868,549
Int. Cl. A47f *7/00*
U.S. Cl. 211—60 R **21 Claims**

Pipe-racking apparatus in which stands of oil well pipe are supported on horizontally spaced beams, a number of such beams being supported for vertical movement on a vertical post so as to confine the racked pipe between the beams when the beams are lowered and so as to allow racking and unracking of the pipe when the beams are elevated.

The beams on each post are vertically movable in succession from top to bottom and each beam has therebeneath spacing devices engageable with the racked pipe below the beam to retain the pipe against movement. The spacing devices are adjustable to accommodate pipe of different sizes. The beams have fingers pivoted thereto and movable between substantially vertical positions to substantially horizontal pipe-receiving positions.



Operating and control hydraulic and pneumatic systems for effecting elevation of the racker beams and actuation of the pivoted fingers.

3,612,287
FLOOR DISPLAY FIXTURES

Roy A. Maltese, Chicago, Ill., assignor to Poster Products, Inc., Chicago, Ill.

Filed Oct. 13, 1969, Ser. No. 865,686
Int. Cl. A47f *5/00*
U.S. Cl. 211—86 **2 Claims**

Floor display fixtures are provided in which tubular upright support members for shelves, dividers, structures containing drawers and other display devices are tapered at one end and inserted into tapered tubular floor plugs or are secured to a tapered tubular adapter which is inserted into a tapered tubular floor plug.

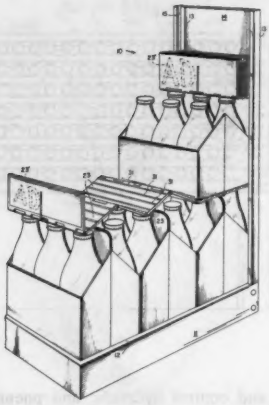
3,612,288
HINGED DISPLAY RACK

James Richard Lesley, P. O. Box 685, Clayton, Ga.

Filed Aug. 27, 1969, Ser. No. 853,422
Int. Cl. A47f *3/14, 5/10*
U.S. Cl. 211—132 **9 Claims**

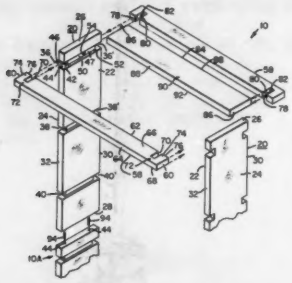
A display rack for stacking articles which normally do not

form a stable stack in which the shelves are constructed of a plurality of sections hingedly connected at their sides and



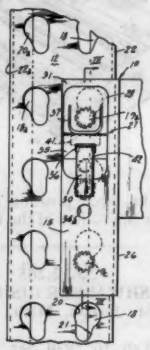
spring loaded to retract in an accordionlike manner as each article is removed from the stack.

3,612,289
FURNITURE CONSTRUCTIONS
Leonard N. Zink, Philadelphia, Pa., assignor to Line Products, Inc., Philadelphia, Pa.
Filed June 23, 1969, Ser. No. 835,488
Int. Cl. A47f *5/00*
U.S. Cl. 211—148 **13 Claims**



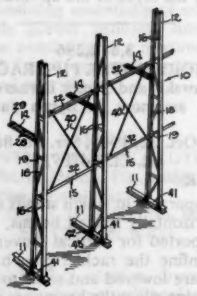
Furniture constructions, such as desks, credenzas, record racks, room dividers, bookcases, and the like, have a pair of spaced-apart vertical endpieces and one or more horizontal shelves, each endpiece having notches entering both side edges at each shelf level. A groove in the inner face of each endpiece connects each pair of notches at each shelf level. Each shelf consists of three, substantially flat, longitudinal sections; namely, a center section and a pair of outer sections which are mirror duplicates. The longitudinal ends of the center section are received within the grooves in the inner faces of the endpieces. Each end of each outer section extends beyond the corresponding end of the center section and is formed with an inwardly opening recess which defines a neck and an inturn tab. In assembled condition the necks are fitted in corresponding notches in the endpieces, and the tabs overlie the outer faces of corresponding endpieces.

3,612,290
RELEASABLE KEY CLAMP FOR A PALLET RACK
Robet J. Evans, Aurora, Ill., assignor to Aurora Equipment Company, Aurora, Ill.
Filed Aug. 12, 1969, Ser. No. 849,426
Int. Cl. A47f *5/10*
U.S. Cl. 211—176 **12 Claims**



A connecting structure adapted to adjustably and releasably connect two supporting members of a structure such as a pallet rack. The connecting structure includes one structural member having headed connecting elements spaced thereon and the other structural member having spaced slots or apertures having a wide portion for receiving the headed connecting elements and a narrow portion preventing the removal of the connecting elements once they are inserted therein. To prevent the accidental disengagement of the headed connecting elementfrom the slots, a safety locking means comprising a pin-locking member urged by a spring through an aperture adjacent one of the connecting elements into the wide portion of the slot receiving the connecting element is provided and includes a release lever engageable with the spring to release the spring pressure holding the locking pin in its locking position and to withdraw the locking pin to enable the disassembly of the connecting structure or system.

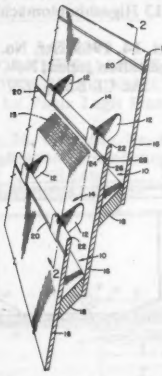
3,612,291
CANTILEVER RACK WITH TRUSS UPRIGHTS
Leroy F. Skubic, Long Beach, Ind., assignor to The Paltier Corporation
Filed Mar. 19, 1969, Ser. No. 808,419
Int. Cl. A47f *5/10*; E02d *27/42*; E04c *3/30*; E04h *12/10*
U.S. Cl. 211—176 **5 Claims**



A cantilever rack having upright columns formed of a truss construction and being tapered upwardly to provide a structure of maximum strength and stability with a minimum of material. The columns each include a pair of generally C-shaped channels which are inclined toward each other to

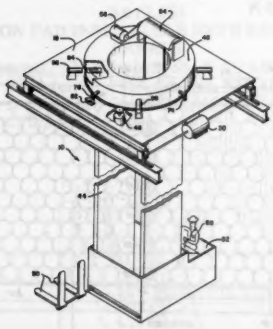
provide a wider column base than top and are interconnected by horizontal and diagonal truss members. The upright columns are secured to the rack base by tension fasteners which incur only minimal shearing stresses.

3,612,292
DISPLAY RACK AND DIVIDER
Charles H. Nervig, Berea, Ohio, assignor to American Greeting Corporation, Cleveland, Ohio
Filed Aug. 28, 1969, Ser. No. 853,791
Int. Cl. A47f *5/00, 7/00*
U.S. Cl. 211—184 10 Claims



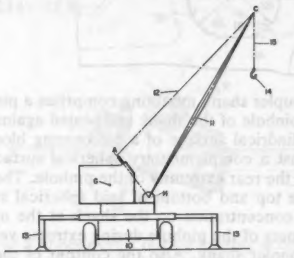
A display rack of the type used for displaying stationery items such as cards and the like. The rack comprises troughlike shelves and associated divider members. The divider members and the shelves are arranged so that the members can be easily adjusted longitudinally of the shelves but cannot be readily removed.

3,612,293
AUTOMATIC CONTROL TRANSLATION SYSTEM FOR MATERIAL STACKER
George K. Ostrander, Angelica, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.
Filed Dec. 29, 1969, Ser. No. 888,601
Int. Cl. B66c *17/00*
U.S. Cl. 212—21 9 Claims



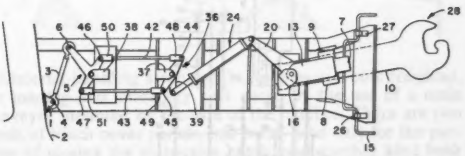
A control translation system for automatically changing the drive controls of an operator driven rotatable stacker crane when the crane rotates to an orientation other than a predetermined reference orientation. The system is particularly applicable in stacker cranes which employ a "joystick" for controlling all lateral movement of the crane. The control system includes an orientation responsive switching network for translating the control of the lateral drive motors by the "joystick."

3,612,294
LOAD CONTROL APPARATUS FOR CRANES
Alvin H. Wilkinson, Talala, Okla., assignor to Auto Crane Company, Tulsa, Okla.
Filed July 31, 1969, Ser. No. 846,387
Int. Cl. B66c *13/50*
U.S. Cl. 212—39 MS 2 Claims



Apparatus for preventing the tipping over of cranes which includes a loading beam positioned colinear with the line extending from the hinge point of the boom to the anchor point of the boom support means, one end of the beam being connected to the frame, the other end of the beam constituting the anchor point, and means responsive to the deflection of the anchor end of the beam for limiting the tilting moment of the crane.

3,612,295
COUPLER-POSITIONING DEVICE FOR RAILWAY CARS
Wilbert G. Glauser, Alden, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Sept. 8, 1969, Ser. No. 855,916
Int. Cl. B61g *5/00, 7/12*
U.S. Cl. 213—15 14 Claims



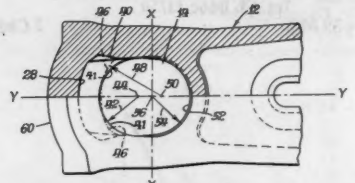
In a coupler-positioning device, the truck is used to position the coupler to achieve "face-on" or "in-line" coupling or as near to this condition as practicable. The "face-on" or "in-line" position may be defined as that position in which the centerlines of the two adjacent couplers are in-line or coincident. The coupler is not necessarily on the centerline of track. A mechanical arrangement is provided to be used in conjunction with the centering yoke assembly to provide a straight mechanical system that suits the fixed sill construction of a long high-capacity freight car. Motion of the mechanism is initiated from a bracket attached to the transom or bolster of a truck. Means are provided for disengaging the device to allow manual positioning of the coupler for coupling at tangent points to curves and on crossovers.

3,612,296

BEARING BLOCK CONTOUR

Frederick C. Kulieke, Tallmadge, Ohio, assignor to Amstead Industries Incorporated, Chicago, Ill.

Filed Sept. 11, 1969, Ser. No. 857,124
Int. Cl. B61g 9/00, 9/20
U.S. Cl. 213—69 4 Claims



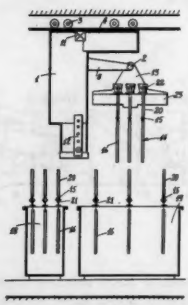
A railway coupler shank mounting comprises a pin extending through a pinhole of the shank and seated against a complementary cylindrical surface of a pin-bearing block which is seated against a complementary spherical surface of the shank defining the rear extremity of the pinhole. The block is recessed at the top and bottom of said spherical surface to prevent stress concentration on the shank at the upper and lower rear corners of the pinhole during extreme vertical angling of the coupler shank. Also the contour of the pinhole and block have been changed to minimize downward movement of the block from its normal and proper position during buffing forces on the coupler. Top and bottom edges (41 of FIG. 10) are made on a full radius (42) to reduce stress concentration in the rear corner areas under normal draft use and/or during angling up or down.

3,612,297

DEVICE FOR HANDLING OBJECTS WHICH ARE SUBJECTED TO SURFACE TREATMENTS

Pierre Lapostolet, Ecouen, France, assignor to Les procedes Rovac Chemin des Reniers, Villeneuve-la-Garenne (Hauts-de-Seine), France

Filed Feb. 9, 1970, Ser. No. 9,874
Claims priority, application France, Feb. 12, 1969, 6903312
Int. Cl. B66c 19/00
U.S. Cl. 214—1 BB 9 Claims



This invention relates to a device for handling objects which are intended to be subjected to surface treatments by immersion in a row of processing tanks in which the objects undergo electrolytic and chemical processes or any operations such as rinsing, dipping and the like.

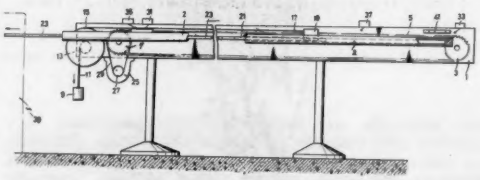
The device comprises a trolley adapted to move above the row of processing tanks and having an arm adapted to move in vertical translation with respect to the trolley and carrying a plurality of object carriers which are applied on completion of their downward vertical translation motion against contact-stops supplied with electric current and disposed at the top of the processing tanks. The object carriers are fastened on the carrying arm by means of two oppositely facing assemblies of blocks capable of moving parallel to the direction of displacement of the trolley and are each provided with a bearing surface, the object carriers being provided with bearing surfaces of complementary shape. The device comprises also means for modifying simultaneously in said both assemblies the spacing of at least two of the blocks of one assembly This arrangement makes it possible to modify the spacing of the object carriers in synchronism and thus to employ different tank lengths according to the treatment to be performed.

3,612,298

AUTOMATIC BAR-FEEDING APPARATUS

Shiro Azuma, 2-10-13 Higashimotomachi, Kokubunji, Tokyo, Japan

Filed Oct. 14, 1969, Ser. No. 866,204
Claims priority, application Japan, Nov. 15, 1968, 43-83267
Int. Cl. B23q 5/22
U.S. Cl. 214—1.2 10 Claims



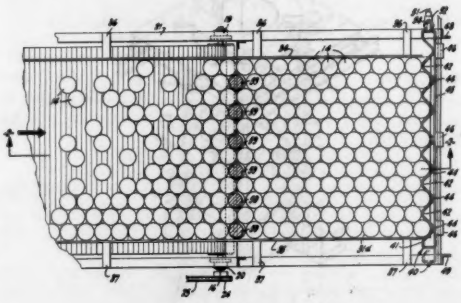
Automatic bar-feeding apparatus having a pusher rod movable to and from a bar machine such as an automatic lathe, for feeding a bar material thereto, the pushing rod being driven by a motor at the initial stage of the feeding stroke and then by gravitational drive through the rest of the stroke, including the machining operation. Means are provided to prevent the bar material from being accelerated by the gravitational drive to strike against parts of the bar machine. The motor drive further functions, in cooperation with a clamping mechanism, to engage the bar material with the pusher rod at the beginning of the feeding stroke, and also to disengage the scrap end of the machined bar from the pusher rod at the end of its return stroke.

3,612,299

PALLETIZER FOR CANS

Stanley B. Shaw, Sunol, and Ronald H. Gehl, Fremont, both of Calif., assignors to C. T. Supply Co., Fremont, Calif.

Filed Feb. 18, 1970, Ser. No. 12,351
Int. Cl. B65g 57/20
U.S. Cl. 214—6 N 16 Claims



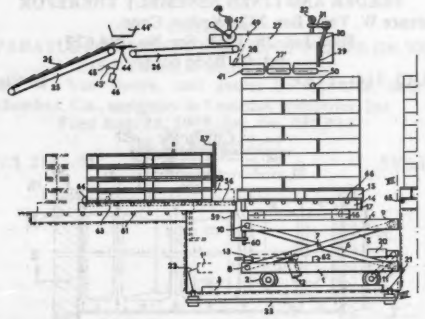
A palletizer for organizing a mass of containers in the form of open metal cans continuously delivered thereto by an infeed conveyor into ordered rows, and for stacking the ordered rows of containers layer by layer onto a pallet therefor. The pallet is removably supported upon a vertically

reciprocable elevator operative to lower the pallet progressively step by step so that the successive layers of containers can be stacked one upon another. The palletizer is operative to offset or stagger the vertically aligned rows of successive layers; and to effect this result it includes transversely reciprocable stop structure having alternate ridges and grooves which define the outer ends of the container rows in each layer, transversely reciprocable interrupter structure that defines the terminal ends of the rows, and plungers forming a part of the interrupter structure which are selectively movable between extended operative and retracted inoperative positions so as to be engageable with certain of the containers advanced theretoward by the conveyor and constrain such containers to terminate the rows thereof forming any particular layer.

3,612,300
INSTALLATION FOR THE PALLETIZATION OF FLAT RECTANGULAR OBJECTS

Marius Berghgracht, Le Vieux Logis Place Jayal, Vineuil St. Firmin, France

Filed Mar. 26, 1969, Ser. No. 810,537
Claims priority, application Luxembourg, Mar. 27, 1968, 55,769
Int. Cl. B65g *57/06*
U.S. Cl. 214—6 DK **10 Claims**

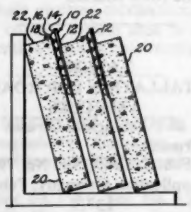


The installation includes means for automatically stacking the objects in superimposed layers on a pallet, each layer comprising four objects arranged so that the assembly thereof has a square outline and in such manner that each object of a following layer simultaneously rests on adjacent portions of two objects in the preceding layer.

3,612,301
CUSHION PAD INSERTABLE BETWEEN HEAVY PANELS

Bobbie D. Peacock, 325 Elizabeth St., N.E., Atlanta, Ga.

Filed July 7, 1969, Ser. No. 839,450
Int. Cl. B65g *1/14*
U.S. Cl. 214—10.5 R **5 Claims**

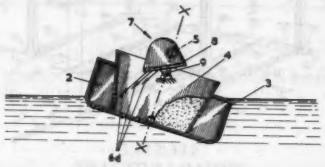


A molded plastic cushion pad for insertion between respective heavy panels such as precast concrete, architectural slabs used in building construction. A typical plastic pad is molded from polyethylene about the size of a small book and is rectangular in formation with a flat, smooth backside and a front side substantially covered with large protruding bumps, and in a pertinent location near one end of the pad there is molded integrally with a pad a short, stubby hanger that extends alongside the panel when the pad is in place. The bumps have spaces between them so that air may circulate.

3,612,302
LOADING EQUIPMENT FOR HOPPER CRAFT

Robert De Groot, Kinderdijk, Netherlands, assignor to N. V. Industrieele, Handelscombinatie, Netherlands

Filed June 15, 1970, Ser. No. 45,972
Claims priority, application Netherlands, June 16, 1969, 69,09161
Int. Cl. B63b *27/00*
U.S. Cl. 214—15 R **8 Claims**

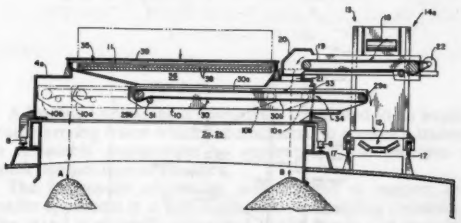


Listing of a hopper craft during loading is counteracted by directing the material to the higher side of the craft. Servomechanism tilts a distributor oppositely to the craft, through a weight-and-linkage system.

3,612,303
MARINE BULK CARGO LOADING ARRANGEMENT

Sukeyoshi Ikeda, Yao, Japan, assignor to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan and Keiichi Miyazaki, Tokyo, Japan, part interest to each

Filed Oct. 6, 1969, Ser. No. 863,993
Claims priority, application Japan, Oct. 5, 1968, 43/72624
Int. Cl. B65g *65/02*
U.S. Cl. 214—15 E **5 Claims**



Material-handling arrangement, such as in a bulk freighter, for loading and unloading bulk cargo by the use of a main conveyor mounted by the side of the hatches. There are two kinds of hatch cover panels, one being used only for the purpose of closing the respective hatch, and another kind both for shutting the hatch and for handling the cargo. A closable hopper is provided as well as a traversing conveyor, whereby the function of delivering the cargo into a hold, supplied from the main conveyor, can be achieved, and whereby the function of delivering the cargo from the hopper to the main conveyor can also be obtained so that the hatch cover is utilized for cargo handling.

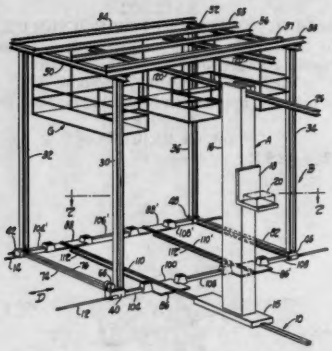
3,612,304
STORAGE STACKER UNIT AND A TRANSFER UNIT THEREFOR

Paul H. Troth, Euclid, Ohio, assignor to McNeil Corporation, Akron, Ohio

Filed Apr. 13, 1970, Ser. No. 27,768
Int. Cl. B65g *1/06*
U.S. Cl. 214—16.4 B **1 Claim**

A material-handling apparatus comprising a floor-supported traveling stacker unit having a horizontally movable

load carrier supported for vertical movement along an upright mast horizontally movable in parallel aisles between tiered rows of storage compartments and a free-standing,



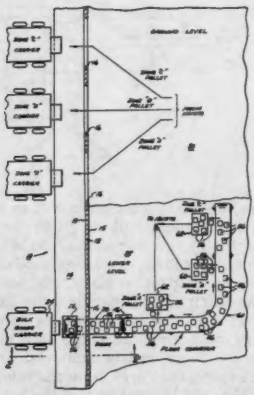
floor-supported carrier or transfer unit movable transversely of the one end of the aisles into which one or more stacker units may be temporarily positioned for service and/or transfer from one storage aisle to another.

3,612,305

LOADING DOCK STRUCTURE AND SMALL GOODS HANDLING SYSTEM

Alvin Wasserman, 1521 Charrington Drive, Birmingham, Mich.

Filed June 16, 1969, Ser. No. 833,303
Int. Cl. B65g *1/00*
U.S. Cl. 214—16 B **7 Claims**



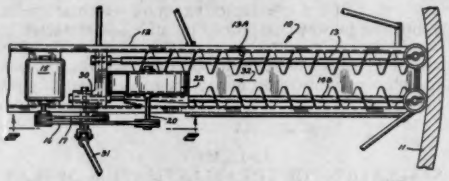
A small goods handling and distribution system for a trunk line terminal for over-the-road hauling carriers including a loading dock conveyor in the form of an endless belt or chain extending directly through an opening in the loading dock surface to provide a means for conveying small goods and packages to a lower level of a warehouse or terminal for sorting and distribution of the small goods according to delivery zones and immediate dispatch to respective zone carriers parked at the same terminal.

3,612,306

TAPERED SIDE SHIELD FOR SILO UNLOADER

Eivind M. Rambo, Maple Plain, Minn., assignor to Van Dusen & Co., Inc., Wayzata, Minn.

Filed Mar. 16, 1970, Ser. No. 19,735
Int. Cl. B65g *65/38*
U.S. Cl. 214—17 DB **3 Claims**



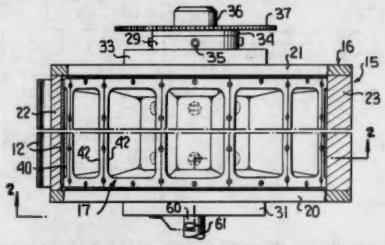
A direct throw silo unloader having two feed augers, and utilizing a tapered shield on one auger of the feed in system so that both sides of the direct throw impeller are fed evenly, in order to increase throw discharge volume of the direct throw silo unloader.

3,612,307

FEEDER AND LINER ASSEMBLY THEREFOR

Clarence W. Vogt, Box 232, Weston, Conn.

Filed Jan. 28, 1969, Ser. No. 794,627
Int. Cl. B65g *65/32*
U.S. Cl. 214—17 CC **10 Claims**



This disclosure relates to a rotary feeder of the pressure differential type which includes a housing having a cylindrical cavity therein with an inlet and an outlet opening thereinto, a rotor mounted within the cavity for rotation relative to the housing, and a fixed stator telescoped within the rotor and supported by the housing. The rotor is provided with a plurality of circumferentially adjacent pockets in which liners are positioned. The liners are separately formed and then bonded together in situ to form a continuous liner assembly having exposed surfaces engageable with the housing to form a seal therewith between the inlet and the outlet. The stator is in the form of a valve, which is preferably formed of a stable plastic and which controls the flow of gases into and out of the pockets as the rotor rotates.

3,612,308

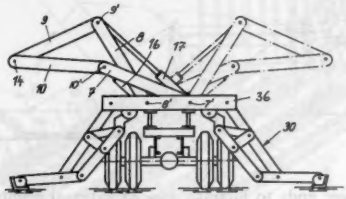
LOADING INSTALLATION FOR ROAD TRANSPORT VEHICLES

Kaspar Klaus, 46 Schlachthofstrasse 894, Memmingen/Bavaria, Germany

Filed Feb. 5, 1969, Ser. No. 796,736
Claims priority, application Germany, Feb. 6, 1968, P 16 80 137.9
Int. Cl. B60p *1/48*
U.S. Cl. 214—77 **8 Claims**

A load transport vehicle having a frame provided with a loading installation for the lateral loading and unloading of at least an essential part of the load in which the installation in-

cludes at least two pivoting units, one unit being located before and the other unit behind the loaD on the frame in the direction of movement of the vehicle, each unit being provided with a first lifting arm means pivotally mounted on the frame with the pivotal axis extending parallel to the longitu-

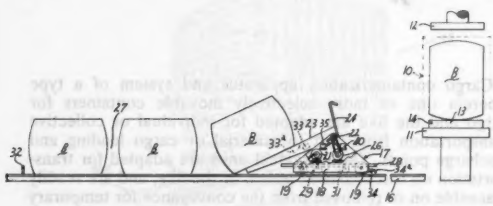


dinal axis of the vehicle, and a second lifting arm means pivotally connected to the first arm means for movement about an axis extending parallel to the longitudinal axis of the vehicle, the second lifting-arm means constituting a load support component, and the operating range of both arm means extending over both sides of the vehicle frame.

3,612,309
APPARATUS FOR MOVING BALES OF FIBERS OR THE LIKE FROM A BALING PRESS

Donald W. Van Doorn, and James B. Hawkins, both of Columbus, Ga., assignors to Lummus Industries, Inc.

Filed Aug. 18, 1969, Ser. No. 851,014
Int. Cl. B65g *47/08*
U.S. Cl. 214—91 **5 Claims**



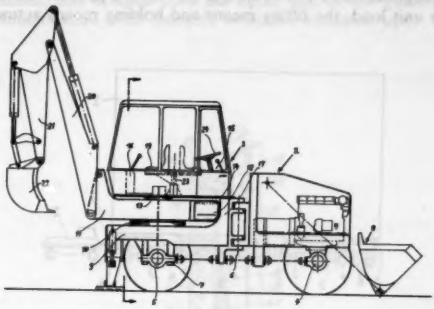
A system for moving bales of fiber or the like from a baling press to a discharge point which includes a powered vehicle having a tiltable bale receiving carriage movable from position to receive the bales to a position gently to discharge the bales. A control system automates the travel of the vehicle between the pickup and discharge positions and causes the carriage to move into bale receiving and bale discharge attitudes at the proper time. The control system also may space the bales from each other on the floor or place them on a conveyor. Also, a bale ejecting mechanism of the press may be included in the control system thus to cause the vehicle automatically to position itself in bale receiving position.

3,612,310
DREDGING LOADER

Hans Schaeff, Langenburg, Germany, assignor to Karl Schaeff KG, Maschinenfabrik, Langenburg am Wurttemburg, Germany

Filed June 20, 1969, Ser. No. 834,959
Claims priority, application Germany, June 20, 1968, P 17 59 912.1
Int. Cl. E02f *3/28*
U.S. Cl. 214—138 **10 Claims**

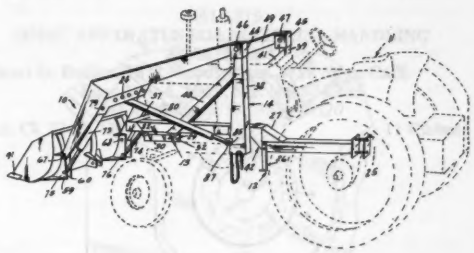
A dredger-loader vehicle having a shovel loader at the front and a dredging outrigger in the rear. The dredger swingably mounted on the rear portion and including a counterweight, all above the rear axle. The motor is located above the front axle.



3,612,311
TRACTOR LOADER

Hass S. Eidy; Edward M. Jankowski, and Richard H. Mott, all of Sioux Falls, S. Dak., assignors to Du-Al Manufacturing Co., Sioux Falls, S. Dak.

Filed Apr. 9, 1969, Ser. No. 814,595
Int. Cl. B66f *9/04*
U.S. Cl. 214—140 **17 Claims**



A loading implement is operatively connected to an implement carrying frame which is constructed to receive a tractor in releasable engagement by apparatus which provides a quick contact type of coupling.

The implement cooperates with a stand to support the loader apparatus in a self-supported, freestanding condition. The stand is pivotally connected to the frame and movable between a ground-engaging position and a storage position by tractor-mounted slides which, upon entry of the tractor into the frame, replace the support offered by the stand and pivot the stand into its storage position within hollow sections of the frame.

A safety linkage is provided between the stand in its downwardly rearwardly extending ground-engaging position and the rear of the frame to prevent forward pivoting of the stand and attendant collapse of the loader apparatus in the event that the apparatus is inadvertently bumped.

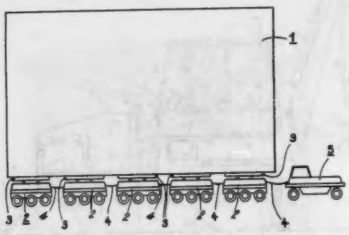
3,612,312
METHOD FOR HANDLING VERY HEAVY UNIT LOADS

George Behrmann, Lauf, Pegnitz, Germany, assignor to Karl Heinz Schmidt, Hersbruck, Germany

Filed June 12, 1968, Ser. No. 736,464
Claims priority, application Germany, June 12, 1967, P 16 55 176.1
Int. Cl. B60p *1/52, 3/40*
U.S. Cl. 214—152 **6 Claims**

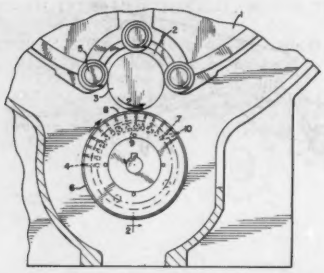
The handling of very heavy unit loads, such as semifinished or finished sections of ships' hulls, ships' superstructures and

sections of ships' superstructures in which at least one lifting means provided with holding means is mounted on at least one multiwheeled vehicle capable of being steered throughout 360°. The vehicle is moved into position beneath the unit load, the lifting means and holding means actuated



to elevate and hold the load, the vehicle is then driven to the desired location and by maneuvering of the vehicle, the lifting means and the holding means, the unit load is placed in the required position.

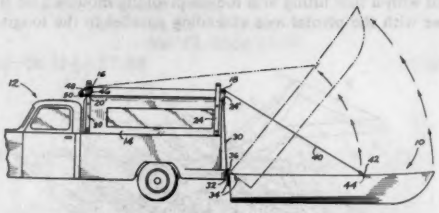
3,612,313
ROTARY VACUUM CAN HOLDDOWN AND METHOD
Harry Lehring, Jr., Elmhurst, Ill., assignor to Continental Can Company, Inc. New York, N.Y.
Filed Oct. 29, 1969, Ser. No. 872,326
Int. Cl. B65g *47/24*
U.S. Cl. 214—340 **5 Claims**



Can spinning is provided by a spinning wheel having a rubberized face. The rubberized face is pierced by conduits connected to a vacuum source. In this way, as a can comes to the spinning operation, the can wall contacts the spinning wheel and is held down against the rubberized material by the vacuum. The vacuum is applied through the conduit only in the area of the surface contact between the can and the wheel. The vacuum is connected to a conduit in the rubber face at a point slightly before the section of the wheel approaches the can wheel contact point. In this way, vacuum is being fully applied at the time the surface area of the wheel adjacent to the conduit contacts the can wall.

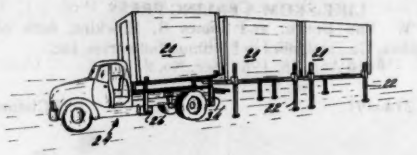
3,612,314
BOAT LOADER AND UNLOADER FOR VEHICLES
Eugene L. Cooper, Route 4, Box 308-C, Sherwood, Oreg.
Filed Apr. 27, 1970, Ser. No. 32,056
Int. Cl. B60r *9/00*
U.S. Cl. 214—450 **8 Claims**

A pair of longitudinally spaced boat-supporting rollers are mounted transversely on top of a vehicle and a driven one of the rollers anchors a pair of laterally spaced boat-handling lines which extend rearward over the rollers for attachment of their rearward ends to opposite sides of a boat forward of the longitudinal center of gravity thereof, with the boat extending longitudinally rearward of the vehicle. A pair of laterally spaced boats support lines extend downward behind the vehicle from adjacent the rear roller for attachment of



their lower ends to laterally spaced external points on the rearward end of the boat.

3,612,315
CARGO CONTAINERIZATION APPARATUS AND SYSTEM
Horace D. Blackburn, 333 6th Ave. West, Bradenton, Fla.
Filed Sept. 4, 1969, Ser. No. 855,225
Int. Cl. B60p *1/64*
U.S. Cl. 214—515 **10 Claims**

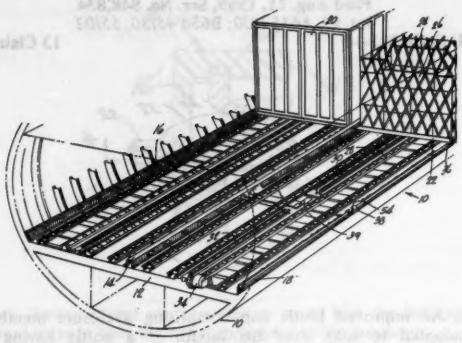


Cargo containerization apparatus and system of a type wherein one or more selectively movable containers for cargo and the like are adapted for individual or collective transportation from and to material or cargo loading and discharge points. The individual units are adapted for transportation on truck chassis, trains, or the like, and are readily placeable on or removed from the conveyance for temporary storage following long-distance hauling and the like, or pickup or local handling. The system includes operating and control means for raising and lowering the individual container units, or a plurality thereof, and is particularly suited and adapted for so raising and lowering an individual unit with respect to an adjoining unit in a line or in areas of restricted clearance to prevent damage to the container during the lifting or placement operation.

3,612,316
CARGO LOADING AND RESTRAINT SYSTEM
Floyd G. Baldwin, Long Beach, and Raymond P. Brenner, Whittier, both of Calif., assignors to McDonnell Douglas Corporation
Filed Dec. 22, 1969, Ser. No. 887,124
Int. Cl. B60p *1/64*
U.S. Cl. 214—516 **4 Claims**

A cargo loading and restraint system within the cargo deck of an aircraft in the form of a conveyor mechanism involving an endless chain assembly continuously operated by a suitable motor. The chain comprises a plurality of interconnected rollers with support pads which are raised by inflatable bags positioned thereunder to contact the bottom surface of cargo pallets to be moved on support rollers from station to station on the cargo deck. The frictional engagement of the support pads with a cargo container moves it to the next station on the support rollers. Each station has its own inflatable bag to be inflated and deflated as desired to move or halt the movement of the pallets along the cargo deck. A latch system is in-

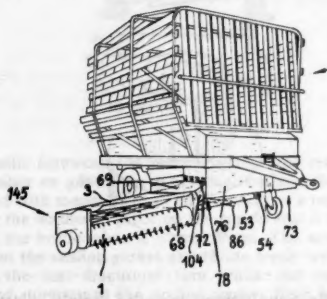
terlocked to the drive system for quickly locking down the containers for pallets when they reach selected positions on



the cargo deck and to deflate bags at those stations to release the drive system from the locked pallets.

3,612,317
LOADING WAGON AND CHARGING MEANS THEREFOR

Ernst Weichel, Bahnhofstr. 1, 7326 Heiningen, Germany
Filed May 19, 1969, Ser. No. 825,598
Claims priority, application Germany, May 18, 1968, P 17 57 555.2
Int. Cl. B60p *1/00*
U.S. Cl. 214—519 **27 Claims**

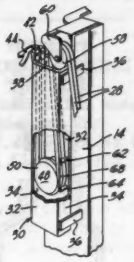


A loading wagon, having a laterally chargeable conveyor duct, is provided with a substantially U-shaped guide trough, open at the top, extending laterally of the conveyor duct and including at least front and rear walls interconnected by a bottom wall. Conveyor prongs are arranged for extension into the guide trough laterally thereof, and are operable to lift material in the guide trough for discharge through the open top thereof onto the conveyor duct. The guide trough receives agricultural commodities from a harvesting implement arranged adjacent the loading wagon. Cutting means preferably are provided to sever the material in the guide trough from material being fed to the guide trough during lifting of the material by the prongs.

3,612,318
HOSE CONFINING AND DISPENSING APPARATUS

Keith E. Ramsey, Pleasant Lake, Mich., assignor to The Knickerbocker Company, Jackson, Mich.
Filed Mar. 5, 1969, Ser. No. 804,529
Int. Cl. B66f *9/14*
U.S. Cl. 214—731 **7 Claims**

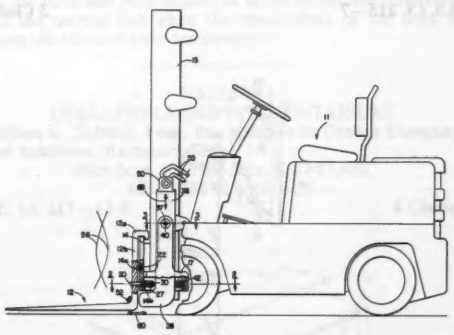
Apparatus for confining, protecting, dispensing and retrieving flexible hose lines used with lift masts, such as the type mounted upon lift trucks, wherein the apparatus includes an elongated tubular guide having a heavy pulley member vertically movable and guided therein. The hose enters the upper portion of the guide, passes under the pulley member, and extends from the upper end of the guide for communication with movable structure mounted upon the



lift maSt. The hose within the guide is completely protected against damage, and the weight of the pulley member imposes a constant biasing force upon the hose, retrieving the hose when the tension therein becomes less than that sufficient to lift the pulley member.

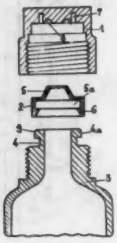
3,612,319
SONIC APPARATUS FOR MATERIAL HANDLING EQUIPMENT

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif.
Filed Nov. 5, 1969, Ser. No. 874,245
Int. Cl. B60p *1/58*; B65g *27/20*
U.S. Cl. 214—750 **11 Claims**



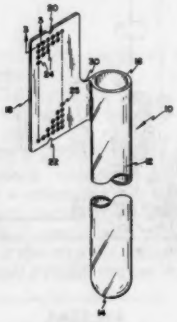
Means are provided to apply sonic energy to selected portions of material handling equipment to reduce the friction at the interfaces between either this portion of the equipment and material to be handled thereby, or in certain instances at the interfaces between equipment portions and the surface over which the equipment is to be moved. Sonic rectifier means are provided for providing a rectified or nonlinear acoustical wave action at the interface at which relative motion is desired, this sonic action providing a propulsive force for either loading material onto the equipment or aiding in the propulsion of such equipment from one position to another.

3,612,320
INVIOLABLE FASTENING FOR RECEPTACLES
Victor Wassilieff, 57, Rue de Maubeuge, Paris 9 eme, France
Filed July 24, 1969, Ser. No. 844,476
Claims priority, application France, July 29, 1968, 160919
Int. Cl. A61j 1/00; B65d 55/02
U.S. Cl. 215—7 5 Claims



An inviolable fastening for receptacles comprising at least one intermediate member inserted between two other members represented by the cap and the neck of the receptacle, in which the inserted member is friction fitted on a corresponding part of one of the two other aforesaid members by means of a previous elastic deformation of one of the two parts, the inserted member being moreover fixed during the closing of the receptacle latter to the aforesaid fitting on the corresponding part of the other of the two members.

3,612,321
CONTAINER FOR BIOLOGICAL FLUIDS
Roger V. Larson, Murray, Utah, assignor to Bio-Logics, Inc., Salt Lake City, Utah
Filed Sept. 15, 1969, Ser. No. 857,975
Int. Cl. B65d 1/00
U.S. Cl. 215—7 3 Claims

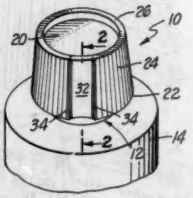


A one-piece container for a biological fluid having a fluid-receiving receptacle and an identification device presenting selectively encodable sites to uniquely identify the source of the biological fluid and tests to be performed therewith. The method of forming the container includes either one-shot molding of the receptacle and identification device, or the identification device is inseparably molded upon an existing receptacle.

3,612,322
CONTAINER CAP
Robert P. Linkletter, 9372 Wilshire Blvd., Beverly Hills, Calif.
Filed Aug. 11, 1969, Ser. No. 848,834
Int. Cl. A61j 1/00; B65d 45/30, 55/02
U.S. Cl. 215—9 13 Claims

An improved bottle cap comprising a closure member adapted to snap over the mouth of a bottle having a peripheral lip, and a locking ring releasably surrounding the closure member to secure it in place. The closure member and the locking ring are provided with cooperating safety lock surfaces which positively lock the two members together. The locking ring may also be provided with radial projections which frictionally engage the bottle neck when the locking ring is released from engagement with the closure member and pushed thereoff.

3,612,323
SAFETY CLOSURE
Dell M. Malick, Route 1, Box 31 A, Santa Rosa, Tex.
Filed Sept. 25, 1969, Ser. No. 861,010
Int. Cl. A61j 1/00; B65d 55/02
U.S. Cl. 215—9 9 Claims



The specification discloses so-called "safety" closure and container neck constructions. A container neck as disclosed carries a ratchet or ratchetlike structure the closure disclosed carries a hinged lever which in turn carries a pawl structure. In a normal locked position of the closure the pawl structure engages the ratchet structure so that the closure cannot be removed from the container. The lever is capable of being moved to an unlocked position in which the pawl and ratchet structures are disengaged. In such an unlocked position the closure may be removed from the container neck.

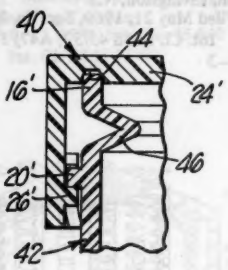
ERRATUM

For Class 215—40 see:
Patent No. 3,612,340

3,612,324
SAFETY CAP AND CONTAINER NECK CONSTRUCTION
Dell M. Malick, Route 1, Box 31A, Santa Rosa, Tex.
Filed Sept. 25, 1969, Ser. No. 861,013
Int. Cl. A61j 1/00; B65d 55/02
U.S. Cl. 215—9 7 Claims

A safety cap and container neck construction is disclosed which is adapted to be opened by the cap being pushed downward upon the neck and being twisted. Cooperating

holding means adapted to be snapped together are located on the interior of the skirt of the cap and on the exterior of the



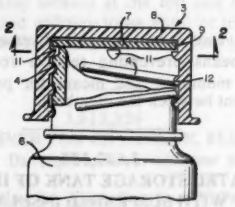
neck. Spring means are provided so as to bias the holding means so as to hold the cap with respect to the container.

3,612,325

PLASTIC SCREWCAP WITH ROTATABLE WASHER

Robert J. Williams, Dover, Ohio, assignor to Dover Molded Products Company, Dover, Ohio

Filed June 19, 1968, Ser. No. 738,149
Int. Cl. B65d *23/00*
U.S. Cl. 215—40 1 Claim



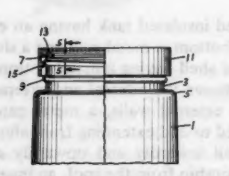
A plastic screwcap for bottles, of the type relying upon a soft washer or gasket for the actual sealing, the cap being provided with means such as an undercut or a central pin for holding the washer in place on the cap so that it does not adhere to the bottle when it is unscrewed. The arrangement is such that the sealing gasket can rotate freely with the bottle during the last fractional turn while the cap is being tightened, to prevent the sealing washer from being torn at this stage, yet the washer is retained in the cap when the latter is unscrewed instead of adhering to the lip of the bottle which it seals thereby retaining the sealing qualities of the cap for reuse.

3,612,326

EXTENSION SEAL FOR A PLASTIC CONTAINER

Raymond H. Marks, Woodcliff Lake, N.J., assignor to Tenneco Chemicals, Inc.

Filed Mar. 20, 1969, Ser. No. 808,761
Int. Cl. B65d *23/00*, *53/00*
U.S. Cl. 215—40 5 Claims



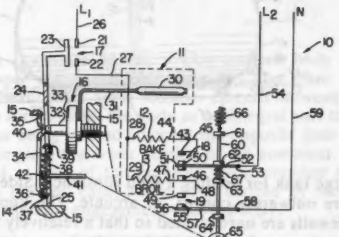
A container comprising a body portion composed of a rigid polyvinyl chloride composition, said body portion having an annular threaded neck adapted to receive a reciprocally threaded closure, said neck terminating in an annular lip, and an annular extension portion composed of a flexible polyvinyl chloride composition affixed to said lip by fusing a vinyl chloride plastisol in juxtaposition with said lip to provide, in combination with the body portion, a unitary structure, said extension portion being adapted so that the extremity thereof will fit securely against the top of said threaded closure when the threads of said closure fully engage the threads of the neck to provide an airtight and a watertight seal.

3,612,327

CONTROL MEANS FOR A COOKING APPARATUS OR THE LIKE

Siegfried E. Manecke, Indiana, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 21, 1967, Ser. No. 692,374
Int. Cl. H05b *1/02*
U.S. Cl. 219—515 12 Claims



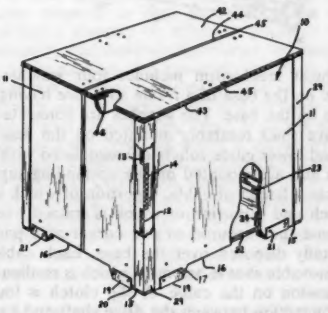
This disclosure relates to an electrical control system for an oven having a bake heater and a broil heater to be operated by a power source having a neutral line and a pair of powerlines, the control means operating the bake heater at substantially full rated power and the broil heater at part of its rated power when the oven is set for maintaining a selected bake temperature below a broil temperature and above approximately 300° F. and the system demands heat input, whereas the control means operates both of the bake and broil heaters at part-rated power thereof in interconnecting the bake and broil heaters in series across one powerline and the neutral line when the temperature of the oven is above the selected bake temperature.

3,612,328

COLLAPSIBLE SHIPPING CONTAINERS

William L. Talbert, York, Pa., assignor to Canton Company of Baltimore, Baltimore, Md.

Filed Sept. 12, 1969, Ser. No. 857,482
Int. Cl. B65d *9/12*, *9/38*
U.S. Cl. 217—12 R 4 Claims



A collapsible shipping container having its vertical walls provided with tongues and notches to interfit, and corner

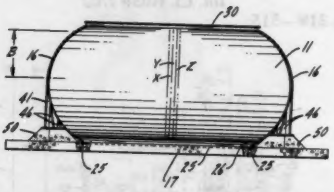
locking members to hold the sides together. The base fits within the setup sides. Each side has a unitary leg which includes a base support. Locking means are provided to hold the base in position, and an alternative design prevents shearing between the base support and the leg, should the loaded box be dropped on a corner.

3,612,329

TANK

John W. Parks, Overland Park, and William K. Mathews, Prairie Village, both of Kans., assignors to Union Tank Car Company, Chicago, Ill.

Filed Sept. 25, 1969, Ser. No. 861,041
Int. Cl. B65d 7/04, 87/02
U.S. Cl. 220—1 B 11 Claims



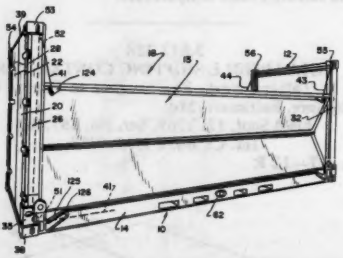
A large tank for holding a fluid substance. Sidewalls of the tank are outwardly convex, or arcuate. The upper edges of the sidewalls are unrestrained so that a relatively high degree of distortion or freedom of the walls is permitted under a fluid head in the tank. The shear flow which is developed in the tank walls acts in summation as a horizontal beam which, anchored at its opposite ends to vertical beam-columns, supports the walls and contained fluid.

3,612,330

HOIST MECHANISM

Austin R. Baer, Elmhurst, Ill., assignor to Allied Products Corporation, Chicago, Ill.

Filed Sept. 11, 1969, Ser. No. 857,117
Int. Cl. B65d 7/26; B65j 1/02
U.S. Cl. 220—1.5 8 Claims



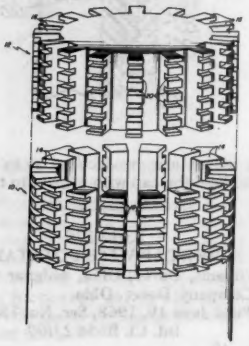
The hoist mechanism includes four winches which are mounted on the base of a frame structure having upstanding supports on the base. The winches are connected to a common drive shaft rotatably mounted on the base. A pair of upper and lower guide rollers are associated with each of the winches and are mounted on the upstanding supports. Each winch has a length of cable, a portion of which is wound on the winch and a portion of which is trained over the guide rollers and then secured to one corner of a panel which is horizontally disposed over the base. Each cable is trained over a movable sheave assembly which is resiliently biased to place tension on the cable. A slip clutch is located in the drive connection between the drive shaft and each winch to stop rotation of each winch when a predetermined tension is placed on each cable wound on each winch, such as when a corner reaches its upward limit of travel.

3,612,331

PRESSURE VESSEL WITH SHEAR BANDS

Svend M. Jorgensen, Tenafly, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.

Filed May 21, 1969, Ser. No. 826,549
Int. Cl. B65d 45/32; A47j 36/10
U.S. Cl. 220—3 4 Claims



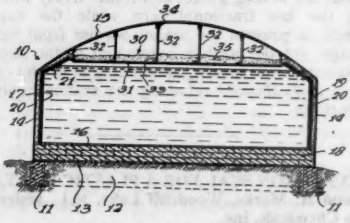
A pressure vessel in which a pair of vessel members are attached by means preventing relative rotative movement between the members, and means for preventing relative axial movement between the members.

3,612,332

INSULATED STORAGE TANK OF INCREASED CAPACITY WITH SUSPENDED INSULATED CEILING

Merwin Bailey Clapp, Homewood, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Oct. 10, 1969, Ser. No. 865,410
Int. Cl. B65d 7/22
U.S. Cl. 220—10 14 Claims



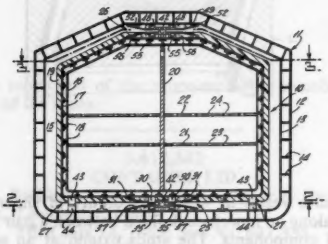
An enclosed insulated tank having an external metal shell with a metal bottom, a metal wall and a sloped metal roof, an internal metal shell having a metal bottom and a metal wall, insulation between the internal and external bottoms and the internal and external walls, a metal canopy member fluid tightly secured to and extending from about an upper part of the inner wall inwardly and upwardly and terminating in spaced relationship from the roof, an insulated fixed-position ceiling suspended from the inside of the roof having its periphery adjacent to, and conforming with, the internal peripheral terminus of the metal canopy, and insulation between the canopy member and the roof.

3,612,333

SECUREMENT SYSTEM USING LOOSE KEYS FOR INDEPENDENT STORAGE TANKS

Walter C. Cowles, Stamford, Conn., assignor to Esso Research and Engineering Company

Filed Feb. 27, 1970, Ser. No. 15,040
Int. Cl. B65d 25/00
U.S. Cl. 220—15 12 Claims



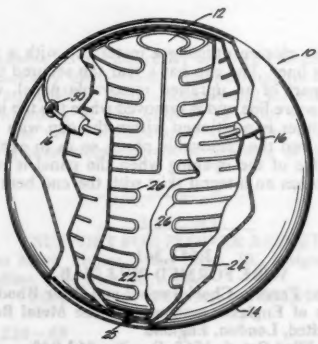
An arrangement for securing independent storage tanks or containers in a tanker or other vehicle of transportation for transporting cargoes below or above ambient temperature wherein the arrangement comprises a system of key-keyway-bearer combinations removed from the neutral axis of the container, preferably located at the top and the bottom of the storage tank and utilizing loose keys, or in other words, keys that are detached from the surrounding keyway-bearer structure.

3,612,334

CONTAINER FOR CRYOGENIC FLUIDS

Paul J. Gardner, Davenport, Iowa, assignor to The Bendix Corporation

Filed Nov. 21, 1968, Ser. No. 777,761
Int. Cl. B65d 25/00
U.S. Cl. 220—15 9 Claims



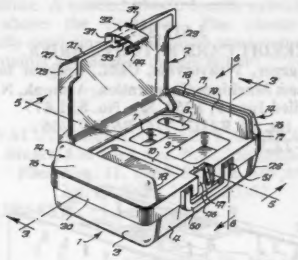
A container having an inner and outer vessel for storing cryogenic fluid. The inner vessel is concentrically separated from the outer vessel by bumper members. The bumper members are spaced on a conduit around the inner vessel. A shield member is located in the space between the inner and outer vessel. A mounting member attached to the conduit is secured to the shield member for preventing direct contact between the outer vessel and the shield member and thereby effectively reduce conductive heat transfer to the inner vessel.

3,612,335

CONTAINER

Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.

Filed Jan. 23, 1969, Ser. No. 793,499
Int. Cl. B65d 25/00
U.S. Cl. 220—16 10 Claims



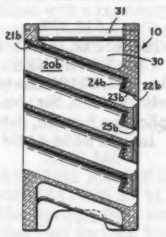
A plastic container having a blow-molded body and a movable cover member injection molded of a clear plastic material. The movable cover member extends between a pair of end caps formed with the body as an integral part thereof, the end caps being located adjacent the opposite ends of the cover to complete the cover portion of the container. Hinge pins formed as part of the movable cover member engage openings in the end caps, and a latch carried by the cover member has locking engagement with the body.

3,612,336

ELEMENT HOLDER OR STORAGE CASE

John V. Wilkich, 136 Forest St., Kearny, N.J.

Filed Oct. 20, 1969, Ser. No. 867,782
Int. Cl. B65d 1/24
U.S. Cl. 220—21 4 Claims



An impact resistant element holder or storage case for glass bottles, ceramic parts and the like frangible elements comprising a body member preferably of molded or compressed plastic material or light expanded metal material shaped to define a plurality of receiving spaces or recesses extending inwardly and downwardly relative the longitudinal line of the body member the receiving spaces or recesses having at least one element receiving opening on at least one face of the body member and a vent and cleanout opening communicating with the receiving space or recess to permit air to escape from the receiving space when an element is placed therein and washing fluid to pass through said receiving space when it is flushed for cleaning purposes. Additionally, each receiving space or recess is provided with a drain means at substantially the lowermost end to permit fluid to drain to and be collected at the lower portion of the body member. The body member is further adapted to receive a handle to render the element holder or storage case portable.

Additionally, the receiving space is provided with a stop means at the inner most end for cushioning the impact of the element and the inner wall of the receiving space is designed to snugly engage the element placed in said receiving space.

Additionally, the body member is so constructed and arranged that it can be stacked easily into a plurality of units for compact storage and ease in carting upon a truck or other conveyor.

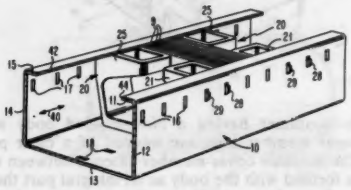
The device also includes in combination a bottle opener formed at a convenient point thereon the body being adapted to collect bottle caps from the bottle opener in the position placed on the body member.

3,612,337

CREDIT CARD BATCH CARRIER

William H. Harger, Weaverville, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 9, 1969, Ser. No. 831,477
Int. Cl. B41l *47/16*; B65d *25/06*
U.S. Cl. 220—22.3 **2 Claims**



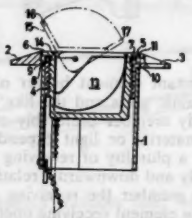
A holder or tray for credit cards or the like. A generally U-shaped tray has open ends, and sides bent over the top to form a pair of rails. A pair of retaining clips hold the cards within the tray in a locked or sliding position. In the locked position, projections on the clip engage apertures in the sides and bottom of the tray. In the sliding position, channels in the clip engage the rails. Cards may be removed by separating the clips and turning the cards to clear the rails, or by sliding a clip and then the cards out of an open end.

3,612,338

CLOSURE DEVICE ESPECIALLY FOR FUEL AND WATER TANKS

Lars Olav Ekman, Box 482, 80106 Gavle 1, Sweden

Filed Feb. 20, 1970, Ser. No. 13,031
Claims priority, application Sweden, Feb. 25, 1969, 2579/69
Int. Cl. B65d *41/04*
U.S. Cl. 220—39 **6 Claims**



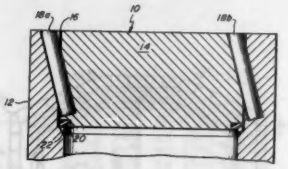
A plug for engagement within the opening of fuel or water tanks particularly of the type utilized in boats and formed of a body adapted to be engaged in said tank opening, said body having a top opening groove or recess and a sector-shaped disc pivotally mounted within said groove or recess along an axis normal to the plug axis and movable between a fully recessed condition and an outwardly pivoted condition whereat to serve as gripping means for manipulating the plug, the disc including counterweight formations preferably along one straight edge thereof to enable self-return of the disc from its outwardly pivoted condition; the pivot axis of the disc being offset from the center of the plug body.

3,612,339

PRESSURE VESSEL WITH SHEAR PINS

Svend M. Jorgensen, Tenafly, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.

Filed May 21, 1969, Ser. No. 826,632
Int. Cl. B65d *53/00*; A47j *27/08*, *36/10*
U.S. Cl. 220—46 **10 Claims**



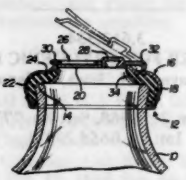
A pressure vessel in which a plurality of shear pins are disposed along an innerface defined between a pair of adjoining vessel components. The studs extend at an angle with respect to the generatrix of the innerface.

3,612,340

CONTAINER CLOSURE AND SEAL WITH PROTECTIVE LIP

Vernon C. Heffran, Perrysburg, Ohio, assignor to Owens-Illinois, Inc.

Filed Sept. 10, 1969, Ser. No. 856,675
Int. Cl. B65d *23/00*, *53/00*
U.S. Cl. 215—40 **6 Claims**



A container closure utilizing a metal cap with a tear tab and a sealing liner. The cap has a tear tab secured to an integral rivet part of an upraised removable panel, which is defined by a score line and is removed when the tab is pulled. The sealing liner is positioned within the cap with an edge that extends into the removable panel, so as to expand and cover the edge of the opening when the panel is removed. The cap also has an integral skirt with the end bent onto itself.

3,612,341

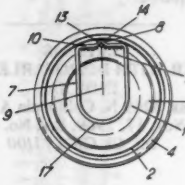
WIRE FORMED PULL-TAB

Jozef Tadeusz Franek, Chorleywood, and Peter Rhodes, Watford, both of England, assignors to The Metal Box Company, Limited, London, England

Filed Oct. 6, 1969, Ser. No. 863,940
Claims priority, application Great Britain, Oct. 7, 1968, 47466/68
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 **7 Claims**

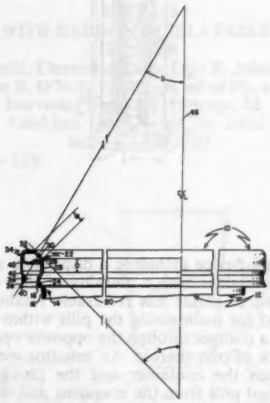
An easy-opening can end having an end panel in which a single panel-opening score is spaced from the periphery of the panel and extends completely around the panel is provided with a pull-tab consisting of a length of wire which is bent to provide a finger loop with the end portions of the wire juxtaposed and extending outwards from the loop to form a score-rupturing member and the tab is secured to the end panel at a position adjacent to the inner end of the score-

rupturing member and inside the panel-opening score in a manner such that on raising the finger loop from the end



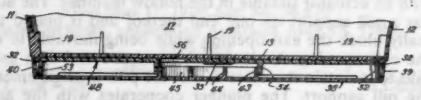
panel the outer end of the score-rupturing member effects rupturing of the score.

3,612,342
CONTAINER LID
Willard J. Rathbun, Castalia, Ohio, assignor to Foster Grant Co., Inc., Leominster, Mass.
Filed July 14, 1969, Ser. No. 841,336
Int. Cl. B65d *43/10, 51/00*
U.S. Cl. 220—60 R 11 Claims



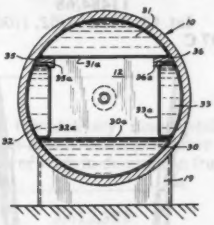
A stackable lid or closure for use with containers having a complementary open mouth rim portion, the lid having a configuration which insures smooth and instant release during coin-feeding of the bottom lid from a vertical stack thereof, the same configuration providing a stack of lids which will resist displacement or jamming of the lids in the stack.

3,612,343
SUPPORT FOR FLOWER BASKET
Cornelius Mark Phipps, Glen Ellyn, Ill., assignor to Plastic Specialties, Inc., Glen Ellyn, Ill.
Filed Dec. 18, 1969, Ser. No. 886,107
Int. Cl. B65d *7/42*
U.S. Cl. 220—69 7 Claims



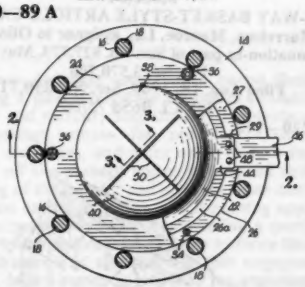
A molded plastic container is relatively long between two ends and relatively narrow between two sides. Secured to the bottom of the container is a downwardly extending molded plastic base of substantially the same configuration as the container. The base defines a cavity between the bottom plate of the base and the bottom of the container. Within this cavity is a supplemental support pivotally connected to the base by interfitting annular bosses. The supplemental support is rotatable between a position at which it is entirely within the cavity and a position at right angles thereto at which the supplemental support extends outwardly beyond the sides of the container. Cams on the bottom of the container force the supplemental support downwardly as it is rotated into the latter position. A molded plastic handle extends upwardly in a loop above the container. The plastic handle has downwardly extending prongs which are received in openings in the container and engage the container.

3,612,344
VACUUM DISPLACEMENT APPARATUS
Robley V. Stuart, 536 63rd Ave. N.E., Minneapolis, Minn.
Filed Aug. 11, 1969, Ser. No. 849,101
Int. Cl. B65d *25/10, 25/02*
U.S. Cl. 220—85 B 2 Claims



A cylindrical housing having a chamber of substantial size for use in a vacuum process wherein the improvement herein relates to the reduction in size of the free space or volume of said chamber to that of the requirement of any given use for said chamber, the improvement consisting of placing enclosed cells within said chamber, said cells being formed of somewhat flexible sheet material and after placement within said chamber being filled with a relatively gas-free liquid having very small response to pressure differentials whereby the space not occupied by said cells will have a vacuum drawn thereon and the walls of said cells will flex sufficiently to equalize the pressure between the working or free space of said chamber and that of the interior of said cells.

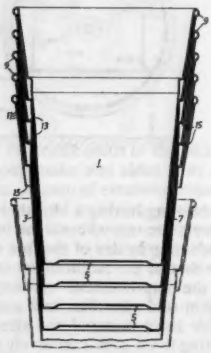
3,612,345
RUPTURE DISC PRESSURE RELIEF STRUCTURE FOR POLYMERIZATION REACTORS
Lester L. Fike, Jr., Blue Springs, Mo., assignor to Fike Metal Products Corporation, Blue Springs, Mo.
Filed July 22, 1969, Ser. No. 843,653
Int. Cl. F17b *1/14*
U.S. Cl. 220—89 A 5 Claims



A rupture disc assembly for use in a system susceptible to both positive and negative pressures and wherein polymerization of resinous materials necessitates cleaning of the assembly. The need for a heretofore required separate vacuum support is eliminated by constructing the rupture member in a manner such that it will withstand substantial negative pres-

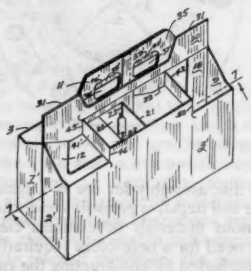
sures while still being rupturable at a preselected positive pressure. The nonfragmenting rupture member is provided with a pair of intersecting grooves extending across the low-pressure side thereof, and the member is constructed of a thickness at least three times as great as would be required to rupture it in the absence of the grooves. A layer of chromium on the high-pressure side of the rupture member presents a surface to which resinous materials have little tendency to adhere and which may be readily and effectively cleaned. The disc clamping unit of the assembly has opposed inner annular edges which tightly engage the disc without the usual groove therearound to preclude accumulation of polymer around the exposed perimeter of the disc.

3,612,346
PLASTICS CONTAINERS
Jack M. Schneider, Chiltern Lodge, 4 Furze Hill, Purley, Surrey, England
Filed Mar. 4, 1969, Ser. No. 804,123
Claims priority, application Great Britain, Mar. 8, 1968, 11484/68
Int. Cl. B65d *21/02, 1/00*
U.S. Cl. 220—97 C **4 Claims**



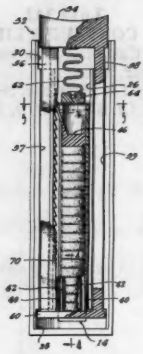
An open-topped, thin-walled, disposable plastics container and a method of and tooling apparatus for making the same, the container comprising an inner member having a bottom wall and a sidewall which extends from the bottom wall to the top rim of the container and an outer, heat-insulating member comprising a skirt which depends from the top rim of the container closely alongside the sidewall of the inner member and is formed in one with the inner member and from one and the same piece of thermoplastic sheet material from which the inner member is formed.

3,612,347
ONE-WAY BASKET-STYLE ARTICLE CARRIERS
Glen R. Harrelson, Monroe, La., assignor to Olinkraft, Inc.
Continuation-in-part of Ser. No. 827,773, May 26, 1969, Pat. No. 3,570,706
Filed Aug. 18, 1969, Ser. No. 850,719
Int. Cl. B65d *75/00*
U.S. Cl. 220—113 **10 Claims**



A strap-style, basket carrier requiring a reduced amount of blank material. The carrier is specifically designed for the packaging of at least eight articles and comprises an improved handle structure. In a preferred embodiment, the bottom and sidewall panels are interconnected by means of sloping marginal panels which further reduce the total amount of blank material required.

3,612,348
PILL DISPENSER WITH DISPOSABLE MAGAZINE AND INDICIA
Michael D. Thomas, 3269 N. California Ave., Chicago, Ill.
Filed Nov. 17, 1969, Ser. No. 877,085
Int. Cl. G07f *11/00*
U.S. Cl. 221—2 **9 Claims**



A dispensing device including a disposable magazine supported in a container with a plurality of pills carried in the magazine. The magazine has releasable retaining means on one open end for maintaining the pills within the magazine and receives a plunger through the opposite open end for engaging a stack of pills therein. An actuator member is interposed between the container and the plunger which will force individual pills from the magazine and will at all times maintain the plunger in engagement with the stack of pills.

The dispensing device further includes indicia of periodicity on the magazine which are aligned with an opening in the container and which cooperate with the plunger to serve as a reminder of whether a pill has been taken for any given period.

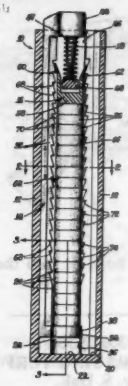
The device is designed so that the magazine and indicia may be sold as a disposable unit, and the remainder of the device may be reused.

3,612,349
PILL DISPENSER HAVING RATCHET-ACTION FOLLOWER
Michael D. Thomas, 3269 N. California Ave., Chicago, Ill.
Filed Sept. 5, 1969, Ser. No. 855,588
Int. Cl. B65d *83/04*
U.S. Cl. 221—4 **8 Claims**

A device for dispensing pills and the like and including a hollow member having an exit opening at one end thereof with an actuator slidable in the hollow member. The actuator has a pill support on one end thereof and is biased to normally block the exit opening while being movable to expose the exit opening. A plunger engages one end of a group of pills to maintain the other end of the pills in engagement with the pill support. The plunger cooperates with the actuator and hollow member to move relative to the hollow member when the actuator is moved to expose the exit opening and is fixed relative to the hollow member when the actuator is returned to close the exit opening.

Indicia are normally packed with the device and the indicia comprises a strip having indicators serially arranged and corresponding to the respective days of the week. There are

seven more indicators than there are pills in the device so that the starting date for taking the pills may be aligned with

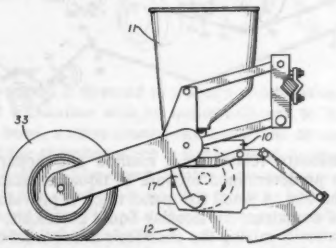


the plunger and serve as a reminder as to whether a pill has been taken for any given day.

3,612,350
PLANTER WITH RADIAL OSCILLATABLE ROD SEED GRIPPER

James Morkoski, Clarendon Hills; Otto E. Johnson, Hinsdale, and Gordon R. O'Neil, Westmont, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 12, 1970, Ser. No. 2,012
Int. Cl. A01c *9/00*
U.S. Cl. 221—219 **5 Claims**



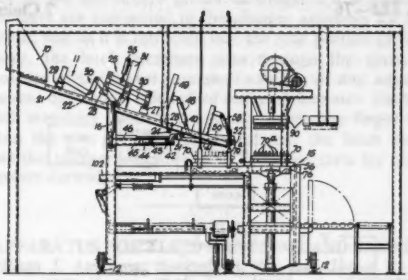
A rotatable seed selecting wheel for a planter comprises a disc having circumferentially spaced radially disposed seed selecting members each having a seed receiving finger or pad projecting therefrom in the direction of rotation of the disc, the finger portions of said members being rotatable with the disc through a seed supply and said members being axially rockable against spring bias by actuating means to an open position to receive and grip a seed between the pad and the disc, the seed being discharged after a predetermined rotation of the seed wheel.

3,612,351
FRUIT FEEDING MEANS OF FRUIT PACKING MACHINES

Izak Johannes Voullaire, Monak, New South Wales, Australia

Filed May 12, 1970, Ser. No. 36,570
Claims priority, application Australia, May 15, 1969, 55063/69
Int. Cl. B65h *3/30*
U.S. Cl. 221—296 **5 Claims**

In a fruit packing machine a downwardly inclined delivery ramp having guides to form fruit fed from a supply bin into a plurality of rows, and a tray having rows of seats to support it in a specified layer formation. The transfer ramp extending downwardly from the lower end of the discharge ramp and includes means to arrange fruit received from the delivery ramp in staggered rows. The transfer ramp may be lowered

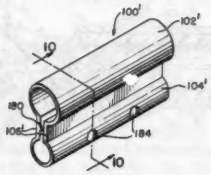


to a level below the delivery ramp while retaining a downward inclination moved rearwardly over the tray in the direction of the rows of seats to deposit the fruit in the seats.

3,612,352
AMALGAM CARTRIDGE AND METHOD OF MAKING SAME AND METHOD AND APPARATUS FOR DISPENSING AMALGAM FROM A CARTRIDGE

Donald G. Smith, 299 Alhambra Circle, Coral Gables, Fla.

Filed Sept. 16, 1969, Ser. No. 858,366
Int. Cl. B67b *7/30*; G01f *13/00*
U.S. Cl. 222—1 **48 Claims**



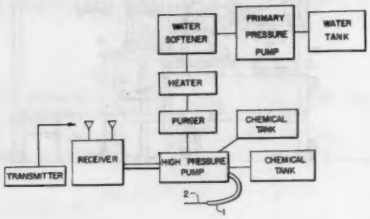
An amalgam cartridge comprises a closed flexible body means having a pair of separate chambers containing amalgam powder and mercury respectively. The body means includes a passage means for providing communication between the chambers, and deformable closure means normally closes off the passage means but can be deformed to permit mixing of the powder and mercury when desired.

An amalgam cartridge mixing and dispensing apparatus includes compression means for compressing a portion of an amalgam cartridge and deforming same to force the contents in the two chambers of the cartridge into engagement with one another. Mixer means is provided for engaging exterior of the cartridge to deform the cartridge in such a manner as to cause intimate mixing of the materials within the cartridge. Reshaping means engages the cartridge to reshape the mixed body of material within the cartridge to a desired configuration. Cutter means is provided for cutting off opposite ends of a cartridge within the apparatus, and ejection means is provided for ejecting the mixed body of material from the cartridge.

3,612,353
RADIO CONTROLLED MOBILE CLEANING APPARATUS

Robert Haase, and Robert Tompkins, both of Quakertown, Pa., assignors to Aero Wash Services, Inc., Quakertown, Pa.

Filed Mar. 13, 1970, Ser. No. 19,380
Int. Cl. B67d 5/06
U.S. Cl. 222—76 7 Claims

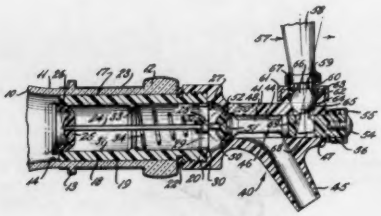


A remotely controlled cleaning apparatus in which the cleaning composition is provided in response to a radio signal.

3,612,354
CONTAINER DISPENSER

Robert E. Sitton, 4829 Bay Court Ave., Tampa, Fla.; Milton P. Zamore, 57 Martinique, Tampa, Fla., and Howard H. Burris, 300 Dolphin St., Gulf Breeze, Fla.

Filed Feb. 18, 1970, Ser. No. 12,313
Int. Cl. B67b 7/24
U.S. Cl. 222—80 3 Claims



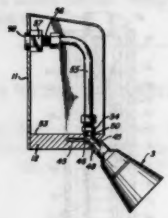
Apparatus for dispensing effervescent liquid contents from a container and for sealing the container when a portion of the contents remains therein. The apparatus includes a first valve structure carried by the container and a second valve structure selectively attachable to the first structure in a manner that operation of the second valve structure will operate the first valve structure to permit the contents of the container to be dispensed.

3,612,355
COMBINATION SHOWER AND TOILETRIES DISPENSER

Karl R. Stucky, and Walter A. Stogsdill, both of Phoenix, Ariz., assignors to Frank W. Turben, by said Stogsdill, a part interest

Filed Jan. 14, 1970, Ser. No. 2,875
Int. Cl. B67d 5/52
U.S. Cl. 222—135 2 Claims

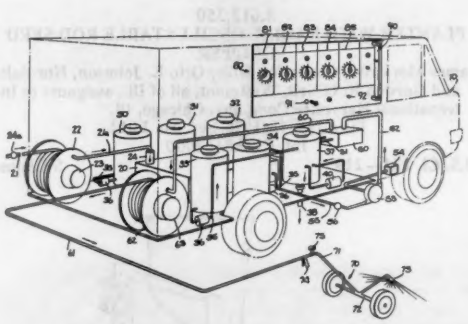
A device for storing and dispensing in a wall fixture associated with a shower head, a plurality of shower bathing fluids. The fluids are stored in aerosol cans receptacled in the device. The cans are selectively actuated by remote push buttons to discharge their contents into a mixing chamber associated with the shower head or into the hand for application to the body.



3,612,356
APPARATUS FOR SPRAYING TURF AND THE LIKE

James B. McVey, Hill City, S. Dak.

Filed Apr. 1, 1969, Ser. No. 811,918
Int. Cl. B67d 5/22
U.S. Cl. 222—145 10 Claims



The disclosure relates to a method and apparatus for spraying a predetermined mixture of liquid chemicals onto turf and the like. A small size panel truck is provided with a plurality of containers for housing liquid chemicals, a means for automatically mixing the chemicals in accordance with a predetermined selection, means for connecting an external water supply to the vehicle, and means for introducing chemicals into the water which is then ultimately applied to the turf or the like.

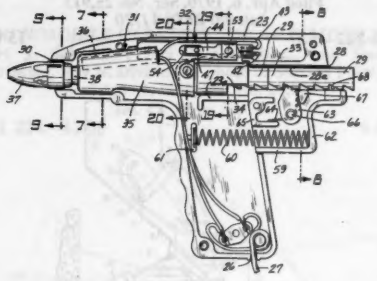
3,612,357
MOLTEN MATERIAL DISPENSERS WITH CONTROLLED FORCIBLE MANUAL FEEDER FOR RATCHET-TOOTHED HEAT-LIQUEFIABLE ROD, HAVING HEATER AND THERMOSTAT

Henry Ruskin, Cranford, N.J., assignor to Swingline Inc., Long Island City, N.Y.

Continuation-in-part of application Ser. No. 721,722, Apr. 16, 1968. This application Oct. 6, 1969, Ser. No. 864,109
Int. Cl. B67d 5/62
U.S. Cl. 222—146 19 Claims

The disclosed gun especially for glue sticks has a melting chamber with an electric heater conspicuously closer to the melted-material discharge nozzle than to the solid material inlet end and a thermostat conspicuously closer to the solid material inlet end than to the nozzle end of the heating chamber for accommodating the supply of electric heat to the rate of discharge of the molten material. The gun has a hand grip carrying the heating chamber, and a pawl-carrying reciprocable manual driver is disposed at the side of the hand grip remote from the nozzle. The driver is controllably but powerfully operable by the squeeze of a hand that embraces

the hand grip and the driver. The liquefiable material has ratchet teeth engaged by the manually driven pawl. The



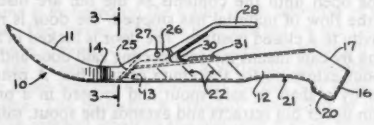
ratchet-toothed rod enters the melting chamber in solid state and acts as a piston for the molten material in the melting chamber.

3,612,358

SPOON COMBINATION HAVING A CHAMBER WITH AN OUTLET AND A VALVE

Gerald Massa, 49 Northern Blvd., Staten Island, N.Y.

Filed Jan. 16, 1970, Ser. No. 3,397
Int. Cl. B67d *5/06*
U.S. Cl. 222—191 **5 Claims**



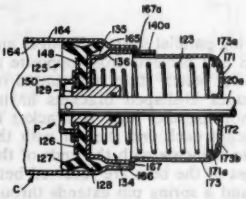
The invention is directed to a spoon combination having a bowl and a chamber with an outlet adjacent to but spaced from the bowl, a valve closing the outlet and an opening on the top of the chamber which is large enough to pour a liquid into the chamber. The spoon combination may include a well underneath the opening in which a pill may be crushed and liquid poured thereover so that a mixture is contained in the chamber until it is dispensed.

3,612,359

HAND OPERATED MULTILOAD GREASE GUN

Edwin P. Sundholm, R.R. 1, Albert City, Iowa

Filed Sept. 2, 1969, Ser. No. 854,574
Int. Cl. G01f *11/06*
U.S. Cl. 222—309 **6 Claims**



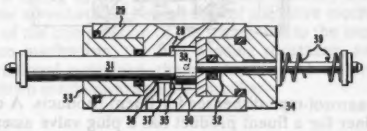
A hand-operated grease gun adapted to use grease in either bulk form or cartridge form includes a grease container having a cylindrical barrel and a cylindrical sidewall of reduced diameter formed integrally with the barrel portion of the container and connected to it by means of a peripheral shoulder which defines a number of curved slots which admit passage through the container wall in an axial direction. A plunger assembly is mounted within the container for reciprocation therein; and it includes a flexible, resilient sealing means for selectively sealing either with the interior surface of the barrel or a grease cartridge, if it is used. Latch members are connected to the plunger assembly for moving with it; and as it is retracted into the rear portion of the container, the latch members pass through the slots in the shoulder of the barrel to extend exterior of and adjacent to the rear cylindrical sidewall of reduced diameter. Each of the latch members includes a laterally projecting finger so that when the plunger assembly is rotated, the latch members hold the plunger assembly in its retracted state for receiving a grease cartridge.

3,612,360

APPARATUS FOR FLUID HANDLING AND SAMPLING

William J. Ambrose, Springfield, Pa., and James E. McErlane, Wilmington, Del., assignors to E. I du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 16, 1968, Ser. No. 753,199
Int. Cl. G01f *11/06*
U.S. Cl. 222—340 **11 Claims**



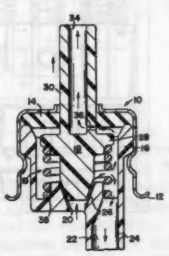
An apparatus and a method for handling and sampling fluids which comprises principally a nonpumping valve designed so that in operation it moves less than a microliter of fluid, and a pumping valve designed to aspirate a precisely determined amount of fluid into the body of the valve with no more motion than is inherent in the operation of the valve itself and with no change in the physical dimensions of the valve. These valves, when used in combination with a transfer probe and a pump designed to handle minute quantities of fluid, form a precision fluid handling and sampling system which will not contaminate or dilute the fluid to be sampled.

3,612,361

SELF-CLEANING VALVE

Ronald F. Ewald, Rollings Meadows, and Norman E. Platt, Fox River Grove, both of Ill., assignors to Seaquist Valve Company, Division of Pittway Corporation, Cary, Ill.

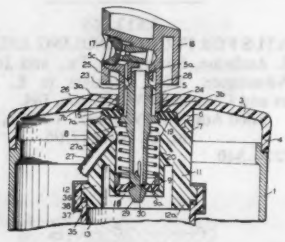
Filed Oct. 20, 1969, Ser. No. 867,622
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.18 **6 Claims**



A self-cleaning valve for an aerosol container wherein a propellant is dispensed prior and subsequent to the aerosol product to clean the valve. This operation is obtained by designing the valve body with separate openings in respective communication with the aerosol product and propellant. As the valve stem is depressed, first the propellant escapes through the propellant opening and cleans the valve until the

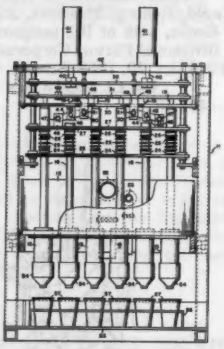
opening is closed by a valve seat on the lower portion of the valve stem; then the product is discharged. The process is reversed when the valve stem is released.

3,612,362
AEROSOL DISPENSER WITH PLASTIC PROPELLANT CARTRIDGE
Edward R. Champagne, Bridgeport, Conn., assignor to Geigy Chemical Corporation, Greenburgh, N.Y.
Filed June 12, 1969, Ser. No. 832,650
Int. Cl. B65d *83/00*
U.S. Cl. 222—402.24 **2 Claims**



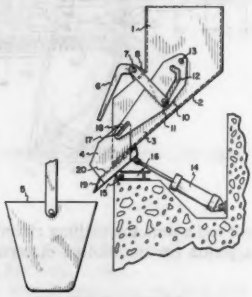
An aerosol-type dispenser for fluent products. A cap for a container for a fluent product has a plug valve assembly depending from the undersurface of said cap. The plug valve assembly has a depending flange and propellant cartridge of a different plastic material than said depending flange and has the open end thereof joined to the bottom of said flange with the plug valve assembly sealing the said open end of said propellant cartridge.

3,612,363
LIQUID DISPENSING MACHINE
Paul H. Carter, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.
Filed Oct. 6, 1969, Ser. No. 863,832
Int. Cl. G01f *11/28*
U.S. Cl. 222—426 **9 Claims**



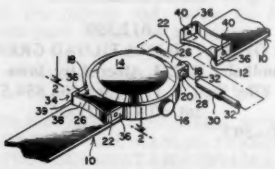
A liquid dispensing machine comprises a series of tubes connected to the bottom of a liquid tank. The tubes have plugs at their tops and bottoms, and means are provided for opening either the top or the bottom plugs exclusively from a position where both plugs are closed. This permits first the filling of the tubes with a given amount of liquid and then discharging the given amount of liquid into receptacles at the bottoms of the tubes.

3,612,364
SKIP-LOADING GATE
Robert Coucher, Salt Lake City, Utah, assignor to United Park City Mines Company, Salt Lake City, Utah
Filed Apr. 6, 1970, Ser. No. 25,913
Int. Cl. B65g *11/20*
U.S. Cl. 222—537 **15 Claims**



The invention pertains to a positive-locking skip-loading gate for a bin having a sloped bottom and an opening at the bottom thereof. The gate comprises a door member rotatably suspended near the top thereof about a pin member, said door contacting a chute extension of said bin and blocking the discharge opening of said bin when in a closed position. The door member, when not positive-locked in a closed position, is forced open by the weight of material in said bin and remains open until the contents of the bin are discharged. After the flow of material has stopped, the door is returned by gravity to a closed position. The door is locked in a closed position by cam means interconnecting said door and a slidable spout extension for the chute of said bin. A piston connected by a shaft to said spout and located in a protected position under bin retracts and extends the spout, said piston also rotating the cam means and locking said door in a closed position when the spout is retracted.

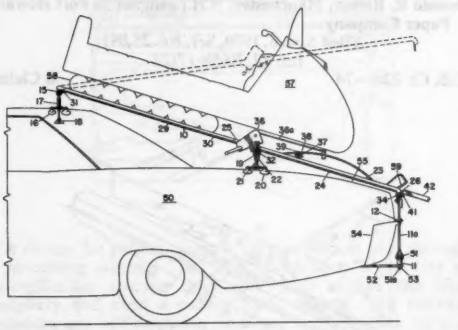
3,612,365
SIMULATED UNITARY BRACELET AND WATCH CASE
Hyman Dintsman, 115 Central Park West, New York, N.Y.
Filed May 4, 1970, Ser. No. 34,411
Int. Cl. A44c *5/14*
U.S. Cl. 224—4 E **12 Claims**



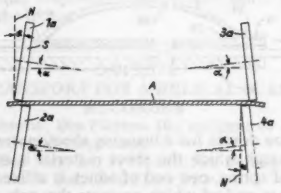
A boss having parallel short side edges and a substantially flat elongated end projects from opposite sides of a watch case. A bracelet watch strap is mounted on the boss. The bracelet includes U-shaped brackets having an elongated reach and short parallel legs. A bracket is affixed to the bracelet adjacent each end thereof with the bracket being open ended to coincide with the ends of the bracelet strap. The side edges of the boss are received between the legs of the bracket and a spring pin extends through a bore in the boss with the ends of the pin extending into registered openings in the bracket legs to retain the bracelet strap. The reach of the bracket is free of the bracelet strap intermediate its end and acts as a leaf spring, bearing against the flat end edge of the boss. Thus, the reach holds the bracelet strap rigid against the watch case simulating a unitary bracelet and case. In an alternate embodiment the reach is unitary with the bracelet along its entire length and spaced from the end

of the boss. A separate leaf spring is inserted in the space between the reach and the end of the boss to hold the bracelet strap rigid.

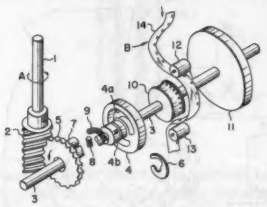
3,612,366
SNOWMOBILE CARRIERS FOR AUTOMOBILES
Herbert J. Schneider, 509 Airline Road, and Daniel J. Kedrowski, 309 N. Division St., both of Stevens Point, Wis.
Filed Apr. 9, 1970, Ser. No. 27,075
Int. Cl. B60r *19/02*
U.S. Cl. 224—42.08 6 Claims



A carrier for transporting snowmobiles and boats on the rear deck area of an automobile. A generally U-shaped support frame is mounted on the trailer hitch assembly of the automobile. The carrier platform is supported on the U-shaped frame, on a forward cross-support assembly mounted on the roof of the automobile, and on a vertically adjustable intermediate cross-support bar mounted on the rear deck of the automobile. The platform is pivotally connected at the forward cross-support whereby the platform may be pivoted upwardly to permit access to the trunk of the automobile. Removable V-rollers are provided on the platform for hauling boats. A winch mechanism and a ramp are provided for loading.

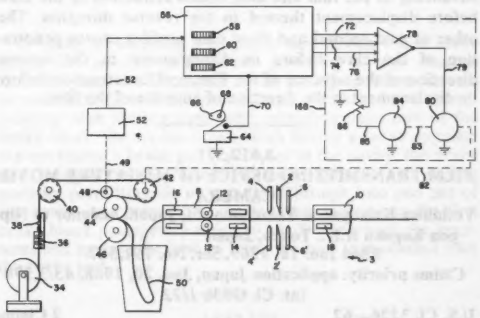
3,612,367
CONTINUOUS LONGITUDINAL DIVIDING OR LONGITUDINAL TRIMMING OF METAL PLATES
Willi Benz, Neuss, and Gerhard Tolasch, Dusseldorf, both of Germany, assignors to Schloemann Aktiengesellschaft, Dusseldorf, Germany
Filed Apr. 8, 1969, Ser. No. 814,419
Claims priority, application Germany, Apr. 10, 1968, P 17 52 152.7
Int. Cl. B26f *3/00*; B23d *19/06*
U.S. Cl. 225—97 6 Claims

A method of and means for the longitudinal trimming or longitudinal dividing of metal plates, particularly of plates more than 20 millimeters thick, by means of pairs of circular blades, wherein the cutting plane is a vertical plane perpendicular to the surface of the plate, and the surfaces that form the cutting edge of at least one of the blades are nowhere either parallel or perpendicular to the cutting plane, but form an angle of preferably between 2° and 20° therewith.

3,612,368
FILM LOOP FORMING DEVICE FOR SMALL-SIZED CINEPROJECTOR
Tokusaburo Kakiuchi, and Hideaki Akiyama, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed July 15, 1969, Ser. No. 841,796
Claims priority, application Japan, July 15, 1968, 43/49765
Int. Cl. B65h *17/26*
U.S. Cl. 226—13 3 Claims



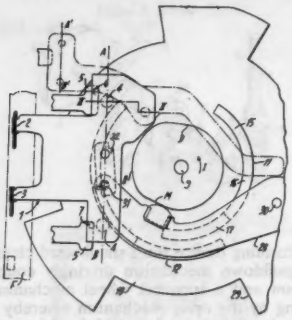
A film loop forming device for a small-sized cineprojector comprising a pulldown mechanism drivingly coupled to a drive mechanism and a sprocket wheel mechanism driven through a spring by the drive mechanism whereby the rotation of the sprocket lags behind that of the drive mechanism because of the compression of the spring due to the inertia of the driven mechanism, the film winding resistance, and the rotary frictional resistance, thereby forming a loop between the pulldown mechanism and the sprocket.

3,612,369
WIRE FEED FOR LEAD MAKING MACHINE
Robert Karl Grebe, Hershey, and Robert Ullman, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Nov. 14, 1969, Ser. No. 876,639
Int. Cl. B65h *23/18*
U.S. Cl. 226—24 5 Claims



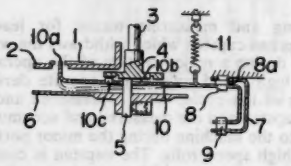
Wire feeding and measuring means for lead making machine comprises capstan which withdraws the wire from a reel or barrel during a major portion of the operating cycle and a set of high speed rolls which operate during only a minor portion of the cycle. Wire is measured and accumulated by the capstan and the measured and accumulated wire is then fed into the machine during the minor portion of the cycle by the high speed rolls. The capstan is controlled by means of a pulse generator which generates a series of pulses in response to the feeding of the wire, the number of pulses generated having a fixed ratio to the length of wire fed. The pulses are transmitted to a counter/controller which controls a printed circuit motor that drives the capstan. The counter can be preset to stop the printed circuit motor after a predetermined length of wire has been fed for a single operating cycle.

3,612,370
INTERMITTENT DRIVE MECHANISM FOR CINEMATOGRAPHIC FILM
Louis Thevenaz, Les Rasses, Switzerland, assignor to Paillard S. A., Sainte-Croix, Vaud, Switzerland
Filed Sept. 24, 1969, Ser. No. 860,668
Claims priority, application Switzerland, Sept. 27, 1968, 14584
Int. Cl. G03b 1/22
U.S. Cl. 226—51 4 Claims



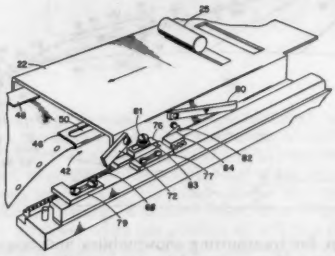
An intermittent drive device for the film engaging claw of a cinematographic projector mechanism includes a first cam profile providing movements of the claw in the forward and reverse direction of the film and second and third cam profiles driving the penetrating movements of the claw relative to the perforations in the film. Each of the cam profiles is rotatably driven by the shaft of the projector motor and a plunger member which transmits the film penetrating movements to said claw is selectively displaceable to cooperate with either the second or third cam profiles. The second and third cam profiles are offset relative to the first cam profile and one of the second and third profiles causes the penetration of the claw before its displacement in the direction of advancing of the film and also causes retraction of the claw before displacement thereof in the reverse direction. The other of said second and third cam profiles causes penetration of the claw before its displacement in the reverse direction of the advance of the film, and its retraction before its displacement in the direction of advance of the film.

3,612,371
FILM TRANSMITTING DEVICE OF MINIATURE MOVIE CAMERA
Yoshihisa Katsuyama, Yokohama-shi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Filed Jan. 16, 1969, Ser. No. 791,567
Claims priority, application Japan, Jan. 20, 1968, 43/3,574
Int. Cl. G03b 1/22
U.S. Cl. 3226—62 2 Claims



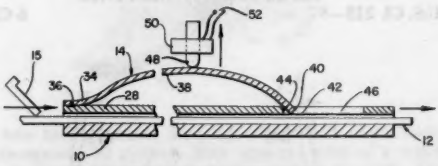
A film transmitting device for a miniature movie camera has a cam associated with a rotary shaft for the shutter and a film transmitting plate provided with a projection cooperable with the cam. The film transmitting plate, which has a claw at one end for entry and retraction from perforations in the film, has its other end formed in substantially U-shape to provide a pair of substantially parallel arm portions. One arm portion is provided with a hole and the other arm portion has a slot which is elongated in the direction toward the plate's claw. Pin means is extended through the hole and the slot. A tension spring is connected to the film transmitting plate to urge the plate's projection against the cam, one end of the spring being connected to the camera body and the other end to the film transmitting plate between the plate's projection and the pin means.

3,612,372
DOOR ACTUATED TICKET DISPENSER
Donald R. Richer, Manchester, N.H., assignor to Fort Howard Paper Company
Filed Apr. 6, 1970, Ser. No. 25,891
Int. Cl. B65h 17/38
U.S. Cl. 226—74 6 Claims



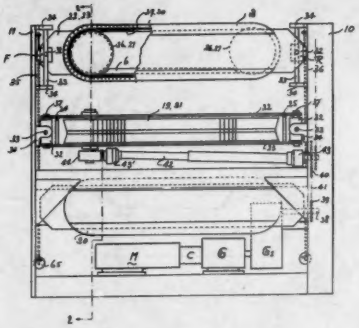
A remote controlled, automatic ticket dispenser for sweepstakes or the like has a single elongated horizontal straight stretch of an endless registration pin chain to register and advance each ticket of a web of tickets, the stretch being advanced by a sliding door. On retraction of the door a ticket is exposed for inscription. On advance of the door the chain is advanced to deliver the ticket. Pawls, or detents, and toothed racks are provided to assure full opening and full closing of the door before the direction of the door can be reversed.

3,612,373
PRECISION ADVANCING DEVICE FOR SHEET MATERIAL
Robert Hermann, Rye Beach, N.H., assignor to Di/An Controls, Inc., Boston, Mass.
Filed Oct. 13, 1969, Ser. No. 865,902
Int. Cl. B65h 17/36
U.S. Cl. 226—162 10 Claims



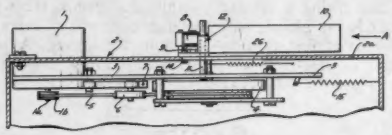
A precision device for advancing sheet material comprises a guide through which the sheet material is adapted to advance, a leaf spring, one end of which is affixed to the guide and the other end of which projects through an opening in the guide toward the sheet material, and a solenoid actuated core, which projects into contact with a medial portion of the leaf spring in such a way as to depress the forward end of the leaf spring into frictional engagement with the sheet material and to advance the sheet material a predetermined increment for each actuation of the solenoid. Since each stroke of the spring is predetermined by stops on the guide, each actuation of the solenoid constitutes a digital input by which the sheet material is advanced by a single increment.

3,612,374
PIPE PULLING DEVICE
Kenneth B. Shartzer, 2416 Randolph Road, Janesville, Wis.
Filed Sept. 10, 1969, Ser. No. 856,767
Int. Cl. B65h *29/12*
U.S. Cl. 226—172 7 Claims



A device for pulling elongate articles such as pipe through a processing machine. The device comprises a plurality of caterpillarlike traction members which engage the pipe periphery and exert a pulling force thereon. The traction members are self-centering and can accommodate various pipe diameters.

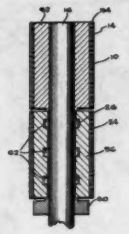
3,612,375
DRIVING MECHANISM FOR CASSETTE TYPE SOUND RECORDING AND REPRODUCING APPARATUS
Hisashi Baba, Tokyo, Japan, assignor to Kyokuyo Electric Co. Ltd., Idogi Ageo-shi Saitama-ken, Japan
Filed July 22, 1969, Ser. No. 843,379
Int. Cl. B65h *17/20*
U.S. Cl. 226—188 9 Claims



A tape recorder wherein the frame supports a motor which drives a flywheel by means of an endless belt. The flywheel is mounted on a platform which is reciprocable toward and away from the motor, and the belt is tensioned by a spring-biased roll which is mounted on the platform. A spring biases the platform away from the motor and the platform is moved toward the motor in response to placing of a cassette onto the frame and in response to subsequent shifting of the cassette toward the motor.

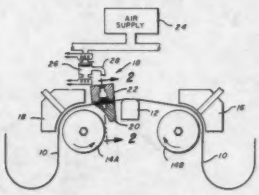
3,612,376
TAPE TRANSPORT FOR A HELICAL SCAN TAPE RECORDER
Delmar R. Johnson, Des Plaines, Ill., assignor to Ampex Corporation, Redwood City, Calif.
Filed Mar. 24, 1970, Ser. No. 24,051
Int. Cl. G11b *15/50*
U.S. Cl. 226—194 4 Claims

A closed loop capstan for a tape transport of a helical scan, magnetic tape recording and reproducing apparatus. The capstan includes a first portion which is fixedly attached to a shaft of the capstan which fixed portion engages a magnetic tape exiting from a transducing tape loop formed about a scanning assembly. The capstan also includes a second portion which is rotatably coupled to the drive shaft by a viscous damping fluid. This viscous coupled second portion engages the tape as it enters the transducing loop. Thus, the second portion of the capstan rotates relative to the first portion of the capstan but because of the viscous coupling, the torque



required to cause rotation thereof is related to the rate of rotation. The capstan thereby effectively isolates supply tape tension fluctuations, but at the same time, passes changes in the level of supply tape tension without attenuation.

3,612,377
TAPE BRAKING APPARATUS
Richard W. Pembroke, Tulsa, Okla., assignor to Midwestern Instruments, Inc., Tulsa, Okla.
Filed Mar. 23, 1970, Ser. No. 21,704
Int. Cl. B65h *23/10*
U.S. Cl. 226—195 9 Claims

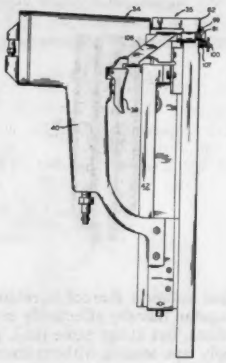


A brake for stopping a magnetic tape having a first brake block and second brake block providing a tape channel therebetween, the first brake block having apertures therein communicating with the channel and a passageway communicating with the apertures and extending exteriorly of the brake block, the second brake block having a cavity opposite the apertures, a brake pad positioned in the cavity, the brake pad being formed of sintered metal spheres and having porosity permitting air to pass therethrough into and out of the cavity, and means for supplying air pressure to the first brake block passageway whereby air flows through the apertures and against the tape to force the tape into contact with the brake pad.

3,612,378
WING-HEADED FASTENERS AND TOOL ATTACHMENTS FOR APPLYING FASTENERS
Richard W. Pabich, c/o Acme-Lane Co. 4904 W. Fullerton, Chicago, Ill., and Richard W. Treiber, deceased, late of Glenview, Ill. (by L. Louise Treiber executrix, 1340 Sherwood Road Glenview, Ill. 60639).
Continuation-in-part of application Ser. No. 615,830, Feb. 13, 1967, now abandoned , and a continuation-in-part of 689,939, Nov. 24, 1967, now Patent No. 3,429,013, and a continuation-in-part of 777,652, Nov. 21, 1968. This application Feb. 12, 1969, Ser. No. 800,362
Int. Cl. B25c *1/04*
U.S. Cl. 227—8 11 Claims

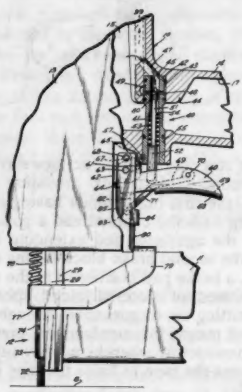
Tool attachments associated with air tools that force nails or other fasteners into members. Uniquely formed wing-headed fasteners and tool attachments are correspondingly adapted to each other to enable the wing-headed fasteners to

be pivotally mounted to said members with the nails from the tool for releasably holding a first member, such as a cabinet



backing in a position relative to a second member such as a cabinet frame therebehind.

3,612,379
PNEUMATICALLY OPERATED FASTENER-DRIVING MACHINE
Walter Charles Panock, Addison, Ill., assignor to Spotnails, Inc.
Filed May 24, 1965, Ser. No. 457,924
Int. Cl. B27f *7/06*
U.S. Cl. 227—8 **2 Claims**



1. In a driving machine of the character described including a motor and means for controlling said motor having a control member movable between motor activating and motor inactivating positions:

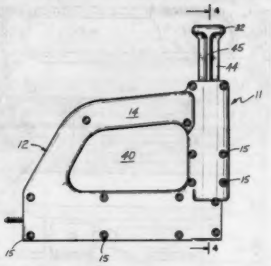
a pivoted lever trigger;

a plunger type safety trigger;

a lever pivotally connected to said lever trigger and operatively related to said safety trigger and to said control member to drive the control member into motor activating position by concurrent operation of the triggers; and

removable means normally restraining said lever trigger against operating movement of said control member except with concurrent operation of the safety trigger, removal of said removable means enabling operation of said lever by the lever trigger to move said control member throughout its operative range independently of said safety trigger.

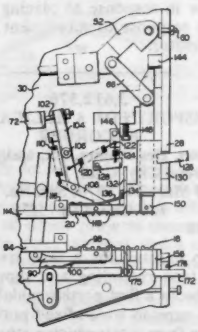
3,612,380
MALLET DRIVE FASTENER DRIVING MACHINE
Richard A. Kuhlman, Forest Park, Ill., assignor to Spotnails, Inc., Long Island City, N.Y.
Filed Aug. 26, 1969, Ser. No. 853,625
Int. Cl. B25c *1/00*
U.S. Cl. 227—120 **2 Claims**



A mallet drive stapling machine is shown which includes a housing, a magazine, a piston raceway and a drive channel within the housing. A follower is movable within the magazine to sequentially propel fasteners contained therewithin into operative relationship with the drive channel. A piston having an enlarged upper portion, an outwardly projecting intermediate portion, and a lower portion is movable within the piston raceway. A driver blade is secured to the lower portion of the piston and is selectively movable within the drive channel to drive fasteners contained therein into work. The lower portion of the piston is substantially circular and between the lower portion and the enlarged upper portion is an intermediate portion which is formed with four projecting portions, each two of these portions are oppositely extending with respect to one another and each pair of said oppositely extending portions are perpendicular with respect to one another.

A coil spring is retained within said piston raceway and surrounds the piston, with the piston raceway having an inwardly extending portion to retain the spring. A resilient bumper is selectively abuttable with the base portion of the piston when the piston is moved downwardly.

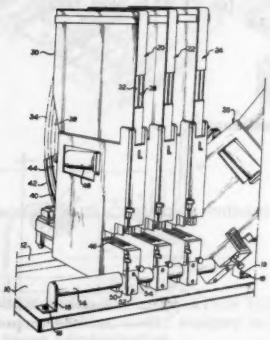
3,612,381
SNAP FASTENER ATTACHING MACHINE
Erich A. Schmidt, Lexington, Ky., assignor to Textron, Inc., Providence, R.I., a part interest
Filed Nov. 12, 1969, Ser. No. 875,688
Int. Cl. A41h *37/04*
U.S. Cl. 227—18 **18 Claims**



A machine for attaching the components of a snap fastener to a material, wherein the snap fastener components are fed

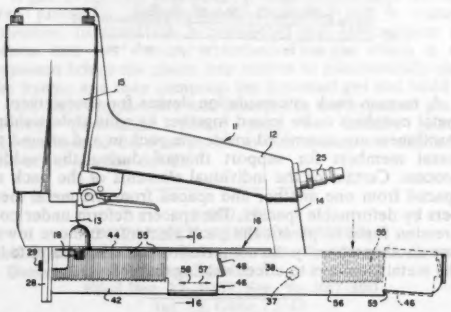
from strips in spaced relation to each other, are separately cut from the fed strips and are clamped together with the material therebetween by means of a ram and cooperating anvil; the feeding, cutting and clamping operations are performed in a particular sequence and are performed automatically upon initial operation of a control device.

3,612,382
SNAP FASTENER ATTACHING APPARATUS
Gilbert A. Littell, Versailles, Ky., assignor to Textron Inc.
Filed Nov. 12, 1969, Ser. No. 875,687
Int. Cl. A41h *37/04*
U.S. Cl. 227—18 **9 Claims**



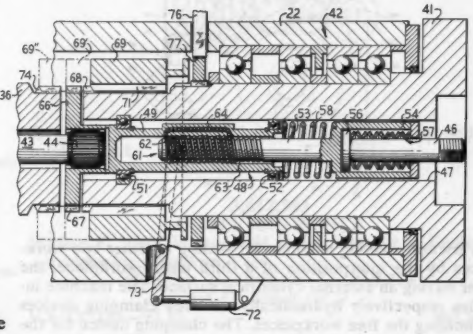
Apparatus for attaching plastic snap fasteners to an article of clothing or the like including a plurality of snap fastener attaching machines mounted in spaced relation to each other on a cylindrical rod permitting each attaching machine to be adjustably spaced from the adjacent attaching machine and permitting each attaching machine to be pivoted away individually from the other machines for servicing and for refilling with snap fastener elements.

3,612,383
MAGAZINE CONSTRUCTION FOR FASTENER DRIVING MACHINE
Garry R. Perkins, Cary, and James Whiteside, Rolling Meadows, both of Ill., assignors to Spotnails, Inc., Long Island City, N.Y.
Filed Nov. 14, 1969, Ser. No. 876,620
Int. Cl. B25c *5/16*
U.S. Cl. 227—125 **3 Claims**



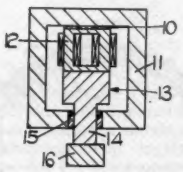
A magazine construction for a fastening device as shown which is integrally formed and includes a body having a longitudinally disposed support. A rail parallel to the support is carried by the body and is provided with a cutout portion at the rear thereof. A base portion joins the support element to the rail. A roof portion is likewise carried by said support element and overlies the rail in spaced relationship therefrom. A follower having an offset handle is slidably disposed upon the rail and a spring carried by the roof portion is connected to the follower and normally biases it forwardly. A plurality of fasteners in laterally aligned relationship are disposable upon the rail.

3,612,384
SPINDLE CHUCK ACTUATOR ASSEMBLY
Calvin D. Loyd, Peoria; Theodore L. Oberle, Washington, and Ronald L. Satzler, Metamora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 25, 1969, Ser. No. 819,336
Int. Cl. B23k *27/00*
U.S. Cl. 228—2 **15 Claims**



A spindle-mounted chuck operated for engagement with a workpiece by an axially movable member and having a rotational drive for rotating the spindle-mounted chuck, the chuck assembly including a screw mechanism for coupling the rotational drive with the axially movable member for selectively engaging the chuck assembly with the workpiece.

3,612,385
ULTRASONIC WELDING TOOLS
Roy William Humpage, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Continuation-in-part of application Ser. No. 688,548, Dec. 6, 1967. This application Mar. 10, 1969, Ser. No. 805,655
Int. Cl. B23k *1/06, 5/20*
U.S. Cl. 228—1 **6 Claims**



In an ultrasonic welding tool of the kind comprising a relatively fixed frame, which supports an assembly including a transducer for converting electrical energy into ultrasonic vibrations, and a velocity transformer carried by the transducer for altering the amplitude of the vibrations produced by the transducer, the assembly is supported against lateral movement relative to the frame, by engaging an axially extending portion of the assembly, which is of substantially uniform cross section, as an axially sliding fit in a bearing, which is fixed relative to the frame in use, so as to support the assembly against lateral movement relative to the frame.

3,612,386

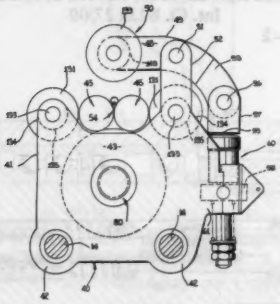
APPARATUS FOR FRICTION WELDING

John Gibson, Penn, Wolverhampton, and Alan Woodall, Claverley, Wolverhampton, both of England, assignors to John Thompson (Pipework and Ordnance Division) Limited, Wolverhampton, England

Continuation-in-part of application Ser. No. 689,876, Dec. 21, 1967, now abandoned. This application Aug. 22, 1969, Ser. No. 852,441

Int. Cl. B23k 27/00

U.S. Cl. 228—2 8 Claims



A friction welding machine for joining together two workpieces by the interposition of a third insert workpiece, the latter having an external cylindrical surface. The machine includes respectively hydraulically actuated clamping devices for holding the free workpieces. The clamping device for the insert workpiece includes two free rollers, defining in combination a cusp-shaped channel, supported by backing rollers driven from a motor and a third pressure roller movable to press the insert workpiece into engagement with the two free rollers so that the insert workpiece is rotated thereby.

3,612,387

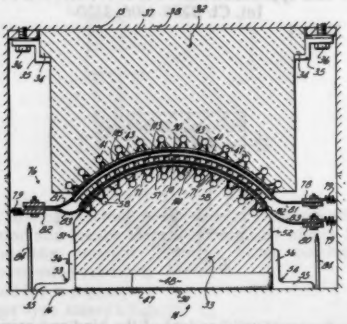
BRAZING METHOD AND APPARATUS

Robert R. Rathbun, Middletown, Ohio, assignor to Aeronca, Inc., Middletown, Ohio

Filed Jan. 7, 1970, Ser. No. 1,234

Int. Cl. B23k 5/00, 1/00

U.S. Cl. 228—6 10 Claims



A method and apparatus are disclosed for brazing articles such as honeycomb sandwich structures. The apparatus includes a cold wall boxlike housing separable into upper and lower sections. Each section carries a ceramic die member provided with passageways terminating in small ports for conducting a cooling fluid adjacent to the work. The workpiece is heated by electrical resistance heater strips passing above and below the workpiece. Means are provided for evacuating the housing and backfilling it with argon. When the workpiece is brought to brazing temperature, two expandable bags are inflated. One bag raises the lower die section to form a general fit with the upper one. The second bag is in direct contact with the upper face of the workpiece and exerts a uniform pressure normal to its surface. After brazing, the bags are deflated and chilled argon is introduced through the die passages to cool the work. Other features include localized temperature control by electron emission or cooling tubes and vapor removal by means of a cold trap.

3,612,388

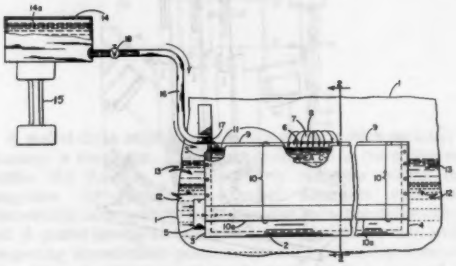
MASS SOLDERING MACHINES

Howard W. Wegener, Rte. 2, Box 91, Wilton, N.H., and Kenneth G. Boynton, Osgood Road, Milford, N.H.

Filed Apr. 14, 1969, Ser. No. 815,970

Int. Cl. B23k 1/00, 5/22

U.S. Cl. 228—34 4 Claims



An apparatus which eliminates the formulation of hot solder dross in the operation of an automatic mass soldering machine of the type which produces a high vertical wave of solder alone or solder and oil and having a horizontal crest.

3,612,389

APPARATUS FOR SOLID-STATE WELDING

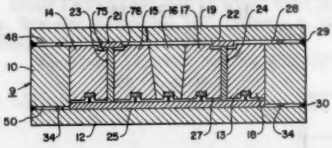
Eugene D. Green, La Mesa, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Division of Ser. No. 569,303, Aug. 1, 1966, Pat. No. 3,497,945

Filed Dec. 23, 1968, Ser. No. 800,312

Int. Cl. B23k 19/00

U.S. Cl. 228—44 2 Claims



A vacuum pack encapsulation device for containment of metal members to be joined together by solid-state welding. Positioners are assembled inside the pack in and around the metal members for support thereof during the welding process. Certain of the individual elements of the pack are spaced from one another and spaced from the metal members by deformable spacers. The spacers deform under compression force to permit the pack elements to move toward one another whereby the compression force is transmitted to the metal members to effect welding thereof.

3,612,390

CONTINUOUS WEB ENVELOPE

Kenneth W. Howard, 5550 Monticello, Dallas, Tex.

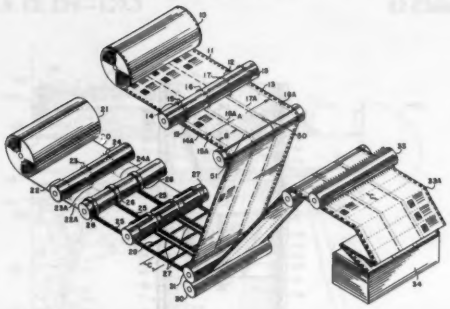
Filed Sept. 2, 1969, Ser. No. 854,434

Int. Cl. B65d 27/10

U.S. Cl. 229—69 3 Claims

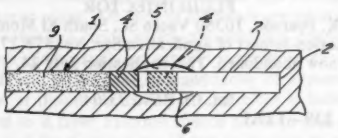
Disclosed is continuous web process for producing a plurality of serially edge-attached envelopes in a double web

without folding or cutting the envelope paper prior to fabrication of the envelope structure. Accounting information



may be recorded on the envelopes individually or in web form.

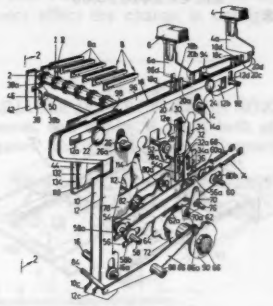
3,612,391
SHOCK TUBE BYPASS PISTON TUNNEL
Stellan P. Knoos, Malibu, Calif., assignor to National Aeronautics & Space Administration
Filed Dec. 13, 1967, Ser. No. 690,172
Int. Cl. B65d *31/00*
U.S. Cl. 230—54 17 Claims



A gas, preferably preheated, is released in a tube having a free piston, a piston bypass structure, and a vacuum chamber. In operation, a portion of this gas bypasses the piston into the vacuum chamber. The gas which is not bypassed brings the piston into motion to automatically close the bypass and then compress the bypassed gas and build up a very high temperature and pressure in the bypassed gas. A second, perforated, piston may be initially placed downstream of the first piston to increase system efficiency and act as a safety device.

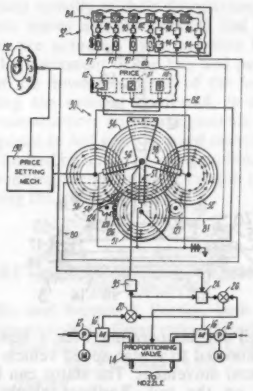
3,612,392
TOTALIZER CONTROL DEVICE
Rolf Bjorn Israelsson, Solna, Sweden, assignor to Svenska Dataregister AB, Solna, Sweden
Filed Dec. 22, 1969, Ser. No. 887,300
Int. Cl. G06c *15/48*
U.S. Cl. 235—60 MT 5 Claims

A totalizer selecting mechanism for a cash register having at least two totalizers mounted on a shaft. The selecting mechanism comprises of first and second control means the first of which moves the totalizer shaft towards the totalizer racks during each totalizer selecting cycle and the second of which can be set in one of several positions the number of which corresponds to the number of totalizers. When the totalizer shaft is moved towards the totalizer racks the first and second means cooperate so that the totalizer intended



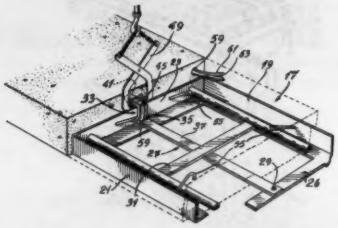
for selection is moved in line and into engagement with the totalizer racks.

3,612,393
COMPUTING DEVICE
William F. Jones, Wethersfield, Conn., assignor to Veeder Industries Inc., Hartford, Conn.
Filed Oct. 21, 1969, Ser. No. 868,069
Int. Cl. G06m *1/272*
U.S. Cl. 235—92 FL 30 Claims



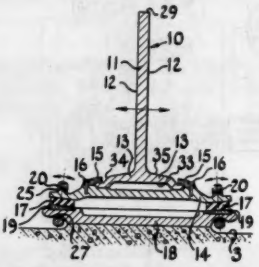
A cost-computing device for a fuel-dispensing system having a rotary pulser disc with a plurality of light apertures arranged in four pulser circles, a plurality of output heads, each having a photoelectric pickup, angularly spaced about the axis of the pulser disc for being operated by the light apertures on the pulser disc, and a rotary selector disc associated with each output head having a plurality of light apertures arranged in four selector circles for selectively activating the pulser circles for operating the respective pickup. The selector discs are connected by intermittent gearing in the manner of a counter such that a rotary input to the lowest order selector disc can be rotated to set the disc counter and thereby set the variator to establish a corresponding multiple place unit volume price. In an alternative embodiment six banks of coaxial selector drums are mounted on a selector plate to be selectively rotated to a control position in operative association with a rotary pulser drum to selectively activate the light aperture circles in the pulser drum to operate the photoelectric pickups.

3,612,394
RAILROAD CROSSING
Wilfrid Gagnon, Comte Temiscoyata, Le Etrolts, Quebec, Canada
Filed Oct. 3, 1969, Ser. No. 863,574
Int. Cl. E01b 26/00
U.S. Cl. 238—8 12 Claims



Building railroad crossing with concrete slabs which are dowel connected at the ends thereof, and by interconnecting these slabs by means of a spring hook provided at one end of a concrete slab and providing a recess at the mating end of an adjacent concrete slab to receive the spring hook in snapping engagement therein.

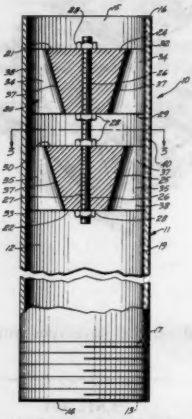
3,612,395
LINEAR MOTOR REACTION RAIL ASSEMBLY
Christopher Durrant English, Burwell, England, assignor to Tracked Hovercraft Limited, London, England
Filed July 16, 1969, Ser. No. 842,152
Claims priority, application Great Britain, July 17, 1968, 34096/68
Int. Cl. E01b 25/00, 26/00
U.S. Cl. 238—122 17 Claims



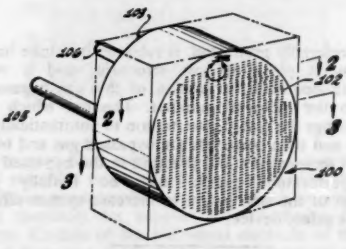
A reaction rail for cooperating with a linear induction motor stator connected to a high-speed vehicle is resiliently mounted for lateral movement. The stator can be guided by wheels running on the rail. Resilient blocks capable of deforming in shear are disposed between a rail-carrying member and the fixed track for the vehicle. In the preferred embodiment the resilient blocks are precompressed by rockable stirrups which reduce the tendency for the rail to tilt under a lateral force.

3,612,396
TURBULENT FLOW LIQUID DISCHARGE NOZZLES
John O. Hruby, Jr., Burbank, Calif., assignor to Rain Jet Corp., Burbank, Calif.
Continuation-in-part of application Ser. No. 784,541, Dec. 9, 1968, now Patent No. 3,558,053, Continuation-in-part of application Ser. No. 691,111, Dec. 8, 1967, now abandoned, Continuation-in-part of application Ser. No. 492,389, Oct. 4, 1965, now abandoned. This application Apr. 27, 1970, Ser. No. 32,332
Int. Cl. B05b 17/08
U.S. Cl. 239—17 21 Claims

A family of aerating liquid discharge nozzles, each of which has the feature that it contains no moving parts and includes a hollow body defining a liquid inlet at one end and an outlet opening at the other end. The body has an internal chamber arranged in communication with both the inlet and outlet ends of the body. Plug means, having substantial length between its opposite end surfaces, is disposed across the chamber adjacent the body outlet end and defines a plurality of grooves which comprise constricted liquid outlet means from the body. The body outlet opening has an area greater than the area of the liquid outlet means. The grooves intermediate their length are increased in cross-sectional area in a discontinuous manner relative to the adjacent portions of the grooves.



3,612,397
FLUID INJECTOR
Ronald K. Pearson, 10350 Vacco St., South El Monte, Calif.
Continuation-in-part of application Ser. No. 578,275, Sept. 9, 1966, now abandoned. This application July 24, 1969, Ser. No. 849,566
Int. Cl. B64d 33/04
U.S. Cl. 239—127.1 24 Claims

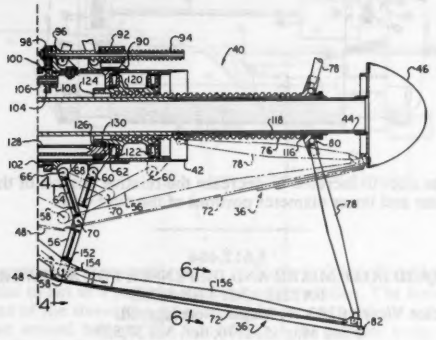


A plurality of preformed individual metal platelets are stacked in registry and brazed together to form a monolithic structure capable of being machined to a desired final overall configuration of injector. Each platelet is formed on one surface with a patterned depressed area defining, with an abutting surface of a contiguous platelet, fluid flow passages exiting at one edge of the platelet in one face of the injector, aligned apertures of the stacked platelets define manifolds for conducting fluid to each platelet, and the individual platelets may be provided with baffling arrangements in the depressed area thereof for equalizing fluid pressures in the several outlets of the platelet.

3,612,398
MODULATABLE NOZZLE SYSTEM

Richard H. Timms, San Diego, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed July 6, 1970, Ser. No. 52,210
Int. Cl. B64d *33/04*
U.S. Cl. 239—127.3 12 Claims

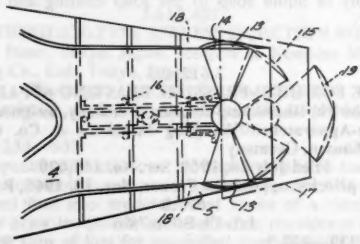


Apparatus generally includes a convergent-divergent outer nozzle duct and a dual cone nozzle plug within and coaxial with the duct and serving as an inner nozzle duct defining with the outer duct a variable area flow path of annular cross section. Forward cone section extends forward from plane of throat of outer duct and aft cone extension extends rearward from throat plane to exit plane. Nose cone forward of dual cones streamlines entire plug. Both cone sections are made up of elongate peripherally overlapping petals with aft ends of forward petals pivoted to forward end of aft petals. Forward ends of forward petals are pivoted to mounting ring on central coaxial support member. Aft ends of forward petals are pivoted to support struts which are pivoted to axially moving second mounting ring to expand and contract both cones at throat plane. Aft ends of aft petals are pivotally connected to actuating struts which are pivotally connected to sleeve which slides axially on support member to expand and contract aft end of aft cone independently of expansion and contraction at throat plane. Support member is hollow, and air supplied to it from external source flows to and through the petals and the forward tip of the nose cone to cool the parts exposed to the hot exhaust gases.

3,612,399
VARIABLE DIRECTIONALLY SILENCED NOZZLE

Barry Rodgers, Mansfield; James A. Petrie Littleover, and Michael John Talbot Smith, Newart, all of England, assignors to Rolls-Royce Limited, Derby, England

Continuation-in-part of application Ser. No. 716,906, Mar. 28, 1968, now abandoned. This application Dec. 5, 1969, Ser. No. 882,457
Int. Cl. B63h *11/10*
U.S. Cl. 239—265.19 8 Claims

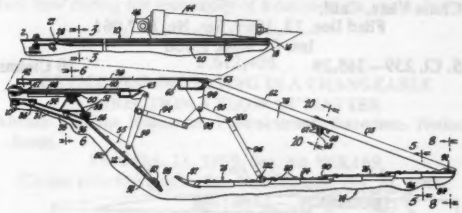


A nozzle assembly for a gas turbine engine intended to effect noise reduction when the aircraft carrying the nozzle is landing or taking off. The nozzle is variable between a cruise configuration in which it has a section which is circular or of regular polygonal form and a noise reduction configuration in which the nozzle dimension in one direction is substantially greater than that in a perpendicular direction. A pair of clamshell doors effect the change in configuration for the nozzle.

3,612,400
VARIABLE JET PROPULSION NOZZLE

Douglas Johnson, and Henry M. Mar, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed June 2, 1970, Ser. No. 42,679
Int. Cl. B64c *15/06*
U.S. Cl. 239—265.19 3 Claims

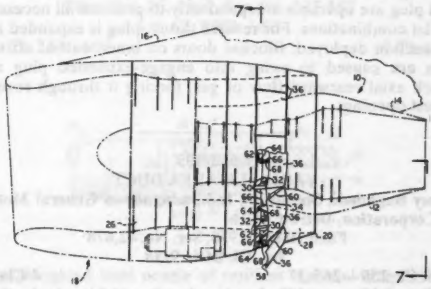


An exhaust duct and variable convergent-divergent propulsion nozzle for a supersonic turbofan engine. The nozzle includes a ring of leaves providing a convergent nozzle portion and a second ring of leaves downstream of the first defining a divergent nozzle portion. The downstream end of the divergent nozzle portion is connected to a ring of leaves defining a fairing around the nozzle. The fairing and divergent leaves are free to float radially at their downstream ends. The converging nozzle leaves and the forward end of the diverging nozzle leaves are actuated by a common linkage so as to coordinate the movement of the two and permit the floating movement of the downstream end of the nozzle. The structure, including the exhaust duct wall, is characterized by lightweight construction and arrangements for cooling the structure exposed to hot gas. Outward movement of the fairing leaves is limited by a ring of swinging links which includes stop means limiting their extending motion to a degree short of straightening the joints.

3,612,401
THRUST-REVERSING APPARATUS FOR TURBOFAN JET ENGINE

Peter H. Ellis, and Samuel I. Persky, both of Chula Vista, Calif., assignors to Rohr Corporation, Chula Vista, Calif.

Filed Jan. 29, 1970, Ser. No. 6,694
Int. Cl. B64c *15/04*
U.S. Cl. 239—265.29 5 Claims



Turbofan jet engine fan air is discharged through passage between engine housing and cowling spaced therearound.

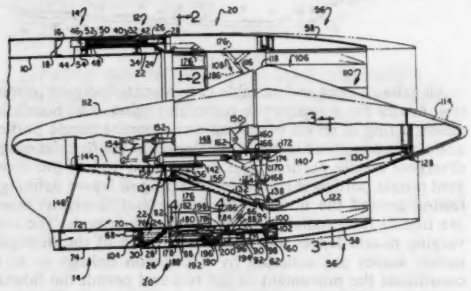
Doors are pivoted to inner and outer sides of cowling adjacent aft edges of openings spaced circumferentially thereof and move between a retracted position closing the openings and a deployed position extending laterally therefrom, the inner doors blocking the fan air passage and deflecting fan air through the openings in the deployed position and the outer doors deflecting the fan air forwardly to reverse thrust. During deployment the inner doors completely block fan air passage only after outer doors are fully deployed, and when doors are retracted the inner doors open the fan air passage slightly before outer doors begin to close.

3,612,402

THRUST-CONTROLLING APPARATUS WITH VARIABLE AXIAL FLOW AREA FOR DIFFERING FLIGHT REGIMES AND THRUST REVERSAL

Richard H. Timms, San Diego, and Leonard Holman, Imperial Beach, both of Calif., assignors to Rohr Corporation, Chula Vista, Calif.

Filed Dec. 22, 1969, Ser. No. 887,061
Int. Cl. B64c *15/06*
U.S. Cl. 239—265.29 **20 Claims**



Apparatus includes shroud positioned at rear or jet nozzle to surround and control gas stream. Shroud includes forward fixed section secured to engine at outlet flange or tailpipe and aft section axially movably mounted to fixed section. In stowed position aft section cooperates with forward section to define shroud as substantially imperforate conduit in continuation outlet or tailpipe. In deployed position, one or more gaps are formed between forward end of aft section and rearward end of forward section for reverse thrust gas flow. Diversion plug coaxial with shroud varies axial flow area for differing flight regimes. Swingable flaps or blades form trailing edge of aft section and vary shape of outer wall. Blades and plug are operable independently to produce all necessary outlet combinations. For reverse thrust, plug is expanded and aft section deployed. Blocker doors on inner wall of aft section are caused to swing into engage-expanded plug and block axial rearward flow of gas, forcing it through reverse thrust openings.

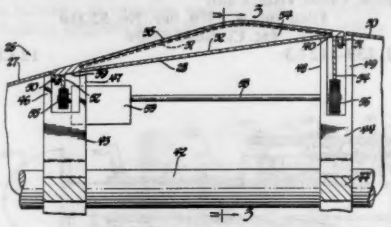
3,612,403

VARIABLE-AREA DUCT

Samy Baghdadi, Speedway, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed June 2, 1970, Ser. No. 42,678
Int. Cl. B64c *9/38*
U.S. Cl. 239—265.37 **4 Claims**

A variable-area diffusing duct in a gas turbine engine is of generally annular cross section and has provision for varying the area of the duct by varying the average diameter of one or the other or both walls of the duct. The arrangement for varying the area involves a circumferentially stepped diameter construction of the duct wall and movable wall units overlying portions of the duct wall and movable circumferentially



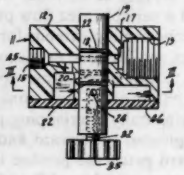
of the duct to increase or decrease the relative portion of the greater and lesser diameter portions of the duct wall.

3,612,404

LIQUID SOAP MIXER AND DISPENSER FOR SHOWER BATHS AND THE LIKE

Vincent Vicari, 8253 W. Maple, Norridge, Ill.

Filed May 15, 1970, Ser. No. 37,539
Int. Cl. B05b *7/26*
U.S. Cl. 239—310 **10 Claims**



Mixing and dispensing shower head including a valve block having an inlet at one end connected with a supply pipe for clear water and having an axially aligned outlet at the opposite end having a spray shower nozzle extending therefrom. The valve block has a liquid soap container extending upwardly from its top with a passageway leading from the soap container to a soap diluting and mixing chamber within the valve block. A water chamber is also contained within the valve block and is supplied with water by a passageway connected with the inlet, and is connected with the soap-mixing chamber to admit water to dilute the soap in the soap-mixing chamber and effect the mixing of soap and water in the diluting and mixing chamber. A slide valve slidably extends through the valve body transversely of the inlet and outlet and controls the supply of soap to the soap chamber and has one passageway of a relatively large diameter leading diametrically therethrough for supplying clear or rinse water to the shower head, and a second diametral passageway of a smaller diameter providing the pressure drop to educt a mixture of soap and water from the soap-mixing chamber to the outlet of the valve. A metering valve has cooperation with the diametral liquid soap passageway in the slide valve to control the supply of liquid soap to the soap diluting and mixing chamber.

3,612,405

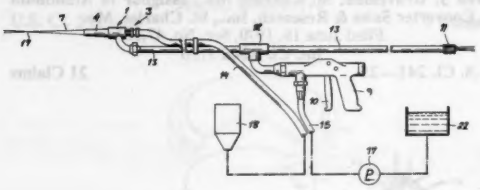
NOZZLE FOR HIGH-PRESSURE BLASTING APPARATUS

Willi Heinrich, Rheinkamp-Repelen, Germany, assignor to Fa. Woma-Apparatebau Wolfgang Maasberg & Co. GmbH, Rheinhausen, Germany

Filed July 28, 1969, Ser. No. 845,400
Claims priority, application France, Nov. 19, 1968, P 18 09 677.0
Int. Cl. B05b *7/06*
U.S. Cl. 239—427.3 **9 Claims**

A nozzle for high-pressure blasting apparatus usable with water at pressures between 300 and 600 atmospheres has a

nozzle housing in which a tubular body is fitted. One end face of the tubular body is formed with a group of small slits surrounding the central bore of the tube and directed slightly inwardly toward the axis of the tube. Sand, corundum (silicon carbide) or metal particles are fed through the central bore of the tube and water is forced through the small



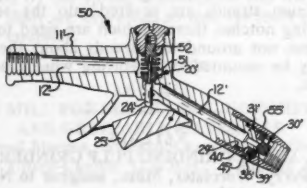
openings in a crownlike array. A sleeve is tightly fitted in the tube to act as a particle-accelerating restriction. The forward end of the sleeve can be recessed from, can be flush with, or can extend beyond the front face of the tubular body, according to desired operating characteristics.

3,612,406

SAFETY BLOWGUN

John E. Bass, Jr., Charlotte, N.C., and George R. Ferguson, Clover, S.C., assignors to G. W. Murphy Industries, Inc., Houston, Tex.

Filed Nov. 3, 1969, Ser. No. 873,205
Int. Cl. B05b *1/32*
U.S. Cl. 239—526 **9 Claims**



A safety compressed-air blowgun for protecting a user thereof against exposure to dangerously high pressures and wherein a pressure-responsive valve is arranged in series flow relation with a manually operable valve for precluding delivery of air from the blowgun at dangerously high pressures through movement of a pressure-responsive valve member relative to a valve seat in response to balancing of air pressures and in such a manner that the valve member is seated to preclude passage of air when the pressure of air downstream of the pressure-responsive valve is above a predetermined safe pressure.

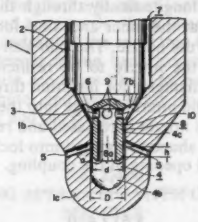
3,612,407

MULTIORIFICE-TYPE AIRLESS INJECTION NOZZLE

Takumi Itano, Tokyo, Japan, assignor to Komatsu Manufacturing Co., Ltd., Tokyo, Japan

Filed Sept. 19, 1969, Ser. No. 859,286
Claims priority, application Japan, Sept. 20, 1968, 43/67594
Int. Cl. B05b *1/30*
U.S. Cl. 239—533 **3 Claims**

This specification discloses an improved airless fuel injection nozzle which injects a controlled amount of finely particularized fuel into predetermined zones of a combustion chamber prior to ignition and thereafter provides a steadily increasing flow of fuel for controlled combustion during the remainder of a combustion cycle. Means are provided for particularizing the fuel prior to ignition by dividing a fuel supply flow into two separate flows and then recombining these flows by a collision process to effect particularization. Means are also provided for cyclically terminating this particularization process and for providing a relatively greater fuel flow during the remainder of a combustion cycle.

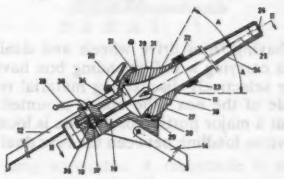


3,612,408

DEVICE FOR DEVIATING IN A CHANGEABLE DIRECTION A FLOW OF MATTER

Abram Jacobus Holleman, Paltrokstraat, Zaandam, Netherlands

Filed Oct. 21, 1969, Ser. No. 868,169
Claims priority, application Netherlands, Oct. 21, 1968, 6815054
Int. Cl. B05b *15/08*
U.S. Cl. 239—587 **3 Claims**



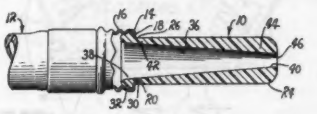
A device for delivering a flow of matter in a variable direction, comprising an inlet piece and an outlet piece, said pieces being interconnected in a ball-jointlike manner in which the forces caused by the flowing pressure and tending to move the two pieces apart are compensated by a tie member disposed in the flow passage through and between the two pieces.

3,612,409

QUICK-CONNECTING, SELF-SEALING FLEXIBLE HOSE NOZZLE

Raymond C. Henning, 205 El Cerrito Drive, Bakersfield, Calif.

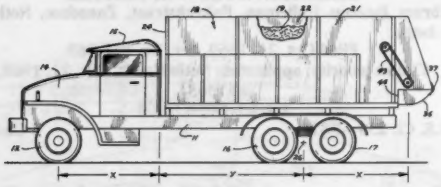
Filed Oct. 20, 1969, Ser. No. 867,557
Int. Cl. B05b *1/00*
U.S. Cl. 239—602 **5 Claims**



An elongated hose nozzle of resilient material adapted to be attached quickly and conveniently to the male-threaded coupling at one end of a garden hose is the essence of this disclosure. The nozzle has an inner end and an outer end. The inner end has a cylindrical periphery adapted to fit through the opening in the coupling, which includes an in-

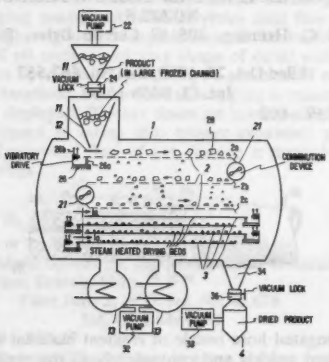
turned flange terminating in a circular opening. A bead of torus form circumscribes the nozzle at its inner end and extends radially outwardly to a dimension greater than that of the cylindrical periphery of the nozzle. A frustoconical passage is formed longitudinally through the nozzle with its greater dimension at the inner end, thus forming a thin wall at the inner end of the nozzle. The thin wall permits the bead and inner end of the nozzle to be resiliently collapsed by hand to a smaller diameter for insertion through the circular opening and past the internal flange into the coupling, where the thin wall of the nozzle is released and resiliently expands towards its normal shape bringing it into locking engagement with the flange and opening in the coupling.

3,612,410
COMBINATION SIX-WHEEL-DRIVE VEHICLE AND SELF-UNLOADING BOX
Charles W. Steinke, 413 North Park, Fairfax, Minn.
Filed June 2, 1969, Ser. No. 829,431
Int. Cl. A01c *19/00*; E01c *19/20*
U.S. Cl. 239—675 **10 Claims**



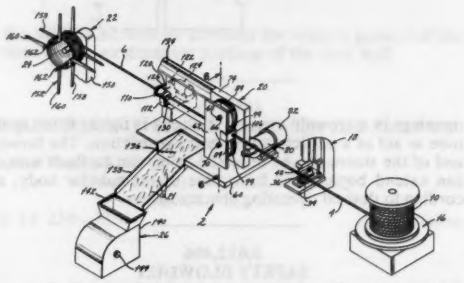
A truck having front drive wheels and dual tandem rear drive wheels carrying a self-unloading box having a rotating spreader for selectively discharging material rearwardly and to either side of the box. The box is mounted on the truck frame so that a major portion of the box is located forwardly of the transverse loadline between the rear dual tandem drive wheels.

3,612,411
CONTINUOUS FREEZE DRYER
Georg-Wilhelm Oetjen, Koln-Marienburg; Franz-Joseph Schmitz, Weiden, and Hanns Eilenberg, Rosrath, all of Germany, assignors to Leybold-Heraeus-Verwaltung GmbH, Koln-Bayental, Germany
Filed Aug. 6, 1969, Ser. No. 847,987
Claims priority, application Germany, Aug. 6, 1968, P 17 79 393.0
Int. Cl. B02c *11/08*
U.S. Cl. 241—23 **14 Claims**



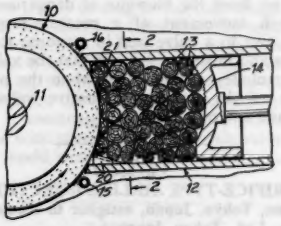
A continuous freeze-drying apparatus and method utilizes a vacuum chamber within which large chunks of frozen material are comminuted into particles of a desired size, are screened within the chamber to separate particles of other than the desired size, and are heated within the chamber to evaporate moisture and to freeze dry them.

3,612,412
PROCESS AND APPARATUS FOR RECOVERING METALS FROM CABLES
Fred J. Graveman, St. Charles, Mo., assignor to Aluminum Converter Sales & Research, Inc., St. Charles, Mo.
Filed June 18, 1970, Ser. No. 47,353
Int. Cl. B26d *1/56*
U.S. Cl. 241—25 **21 Claims**



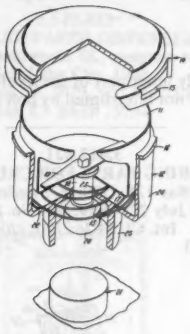
Cable comprising aluminum strands wound about a steel core is reduced to its separate metal components by cutting substantially through the aluminum strands at closely spaced intervals, but leaving the steel core intact. This frees small aluminum strand segments from the core and these segments may be reduced still further in a reduction mill. The core is wound into a roll after the segments are cut away from it. The aluminum strands are severed into the segments by blades having notches therein which are sized to fit around the core but not around the strands about the core. The blades may be mounted on revolving wheels or they may reciprocate.

3,612,413
ANGLE GRINDING PULP GRINDER
James H. Perry, Worcester, Mass., assignor to Norton Company, Worcester, Mass.
Filed May 7, 1969, Ser. No. 822,539
Int. Cl. B02c *19/18*, *23/02*
U.S. Cl. 241—28 **5 Claims**



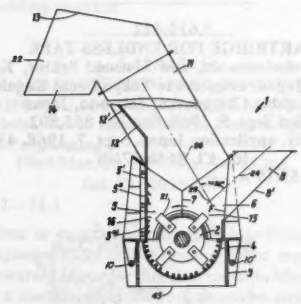
A grinder for making wood pulp wherein the logs are presented to the grinding face of the pulpstone with their longitudinal axes generally parallel to a plane that includes the line of tangency where the logs engage the pulpstone but with the axes of the logs at an angle to the axis of the pulpstone. The axes of the logs are turned at an angle of from about 2° to 30° to the axis of the pulpstone during grinding so that the sides of the logs are progressively disintegrated as the angularly disposed logs are pressed into the grinding wheel.

3,612,414
COFFEE MILL
James M. Nevison, Fareham, and Ronald Leslie Smallbone, Havant, both of England, assignors to Kenwood Manufacturing (Working) Limited, Havant, Hampshire, England
Filed Apr. 10, 1970, Ser. No. 27,228
Claims priority, application Great Britain, May 29, 1969, 27370/69
Int. Cl. B02c *18/12*
U.S. Cl. 241—36 5 Claims



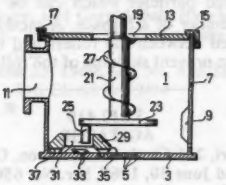
A domestic appliance, such as a coffee mill, comprising a fixed casing within which a spring is positioned to support an axially movable drum. A shaft to which a cutter is attached, is rotatably mounted in a floor of the drum. The spring serves to hold the shaft out of engagement with a drive motor coupling. The drum is provided with a lid which preferably is lockable to the casing. When the lid is properly in place the force exerted by the spring is overcome and the drum and thereby the shaft are depressed so that the shaft engages the drive motor coupling.

3,612,415
BEATER MILL FOR SEPARATING NONGRINDABLE AND GRINDABLE MATERIALS
Herbert Alfred Merges, Wolfgang, near Hanau, Germany, assignor to Ultrex-Chemic G.m.b.H., Wolfgang bei Hanau, Germany
Filed Feb. 24, 1969, Ser. No. 801,534
Claims priority, application Germany, Feb. 27, 1968, Oct. 12, 1968, P 16 07 608.7;P 18 02 819.8
Int. Cl. B02c *13/00, 13/284, 19/12*
U.S. Cl. 241—73 14 Claims



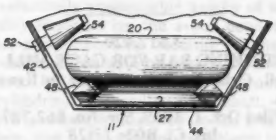
A beater mill for grinding grindable materials and separating nongrindable materials from a mixture comprises a fill chute, a rotor carrying rotating beaters partially surrounded by a sieve, and a discharge chute into which nongrindable materials are driven by the beaters. The discharge chute axis extends tangentially from the rotor for receiving the nongrindable materials. The fill chute has a bottom surface which is connected to the rotor housing at a point which is below the greatest height of the rotor diameter so that the mixture to be ground is struck by the beaters as it flows into the rotor region. The discharge chute is arranged at an angle to the fill chute and has an axis which intersects the fill chute axis within that quadrant of the rotor that faces the fill chute. Accordingly, materials falling back towards the rotor from the discharge chute are more likely to be again driven into the discharge chute and less likely to become jammed between the rotor and the sieve.

3,612,416
COMMINUTING APPARATUS WITH COMMINUTING MEMBER
Ernst Frei, Wurenlingen, Switzerland, assignor to Meto-Bau AG, Wurenlingen, Switzerland
Filed Mar. 28, 1969, Ser. No. 811,322
Int. Cl. B02c *19/00*
U.S. Cl. 241—90 10 Claims



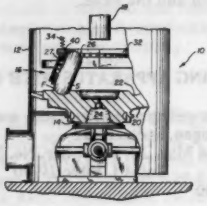
A comminuting apparatus. A receptacle is provided for liquids which contain solids. The receptacle has a bottom wall on which rests at least one and, if desired, more than one comminuting member slidable thereon. A drive is associated with the member and serves to slidably advance it on the bottom wall in a substantially circular path while permitting the member to perform independent movements in direction radially and/or tangentially with respect to the path.

3,612,417
PULVERIZER MILL
Francis M. Barton, Parsippany, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.
Filed Sept. 25, 1969, Ser. No. 861,101
Int. Cl. B02c *15/00*
U.S. Cl. 241—103 6 Claims



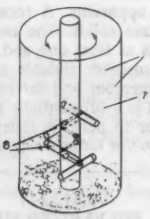
A pulverizing mill is provided with a spider frame which is mounted on the main pulverizing rollers. Flexibly secured to the spider frame are spacer means which are positioned between the rollers.

3,612,418
PULVERIZER
Francis M. Barton, Parsippany, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.
Filed Nov. 3, 1969, Ser. No. 873,256
Int. Cl. B02c 15/00; F16h 1/12
U.S. Cl. 241—118 3 Claims



Apparatus is provided for pulverizing raw coal feed stock into comminuted particles which can be conveyed to the combustion chamber of a furnace. A meshing gear arrangement is provided between the rollers and the thrust ring of the pulverizer to prevent skidding of the rollers.

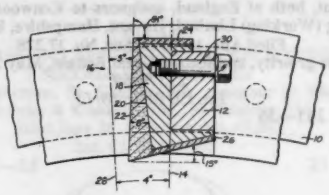
3,612,419
AGITATOR
Andrew Szegvari, 201 Castle Blvd., Akron, Ohio
Filed June 30, 1967, Ser. No. 650,392
Claims priority, application Great Britain, Aug. 9, 1966, 35542/66
Int. Cl. B02c 17/16
U.S. Cl. 241—172 2 Claims



For agitation—that is, either for grinding or for mixing—substantially spherical agitating elements are kept in a state of continuous agitation by means of an agitator formed of a vertical shaft with arms attached tangentially to the shaft. The arms may be straight or curved. Usually the arms are so attached that the distance from the point of attachment to one end of the arm is several times the distance from the point of attachment to the other end of the arm.

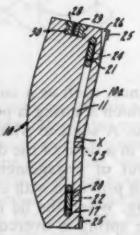
3,612,420
STRIKING BAR FOR CAGE MILL
Frank W. Hull, Orlando, Fla., assignor to Kennametal Inc., Latrobe, Pa.
Filed Oct. 1, 1969, Ser. No. 862,787
Int. Cl. B02c 13/28
U.S. Cl. 241—191 6 Claims

A striking bar for a cage mill in which the striking bar comprises a steel-backing member channel shaped toward the rear so as to fit over the front face of an axial bar extending between the end rings of the cage of the cage mill. The steel backing for the striking bar has carbide facing on the radially outer and radially inner sides and on the side facing away from the axial bar on which the striking bar is mounted. The striking bar is connected to the axial bar of the cage mill by bolts located near the radially outer side of the axial bar



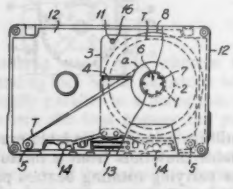
so that the radially inner part of the steel-backing member of the striking bar is not interrupted by bolt holes.

3,612,421
WEARING PARTS FOR CRUSHERS
Erik Arne Sabel, Box 128, Ojebyn, Sweden
Filed July 22, 1969, Ser. No. 843,576
Int. Cl. B02c 2/00, 1/00
U.S. Cl. 241—291 10 Claims



The present invention is related to wear-taking members or plates for crushing or grinding mills, for example, for cone or gyratory crushers, or for jaw crushers. The particular structure shown illustrates a gyratory crusher in which plates involving the invention are shown as surrounding a lower part of a gyrated head, and, therefore, as constituting the wear-taking part of a bowl liner. It will be understood that plates having the same general characteristics, with slightly changed form, may also be employed in connection with one or both jaws of a jaw crusher in which jaws are mounted for relative movement, whereby to define between them a crushing cavity. It will be understood that crushing parts take tremendous wear, and wear away rapidly. A major purpose of the invention is to provide a wear-taking part and a method of making it which permits the use of hard but brittle metals.

3,612,422
CARTRIDGE FOR ENDLESS TAPE
Fukuzo Ito, Yokohama-shi, and Masaoki Sekine, Kawasaki-shi, both of Japan, assignors to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, Chiyoda-ku, Tokyo-to, Japan
Filed Sept. 5, 1969, Ser. No. 855,502
Claims priority, application Japan, Sept. 7, 1968, 43/64556
Int. Cl. B65h 17/48
U.S. Cl. 242—55.19 A 7 Claims



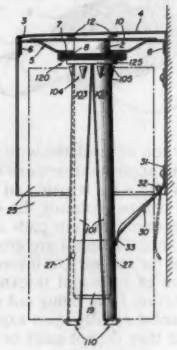
An endless tape cartridge having a hub on which a looped endless tape is wound up in a convoluted manner. A hub

consists of a driving wheel and a driven wheel constructed rotatably. An endless tape is arranged for being wound up on the outermost periphery of the driven wheel pulled out of the innermost convolution of the tape wound up on the driven wheel, and rewound on the outermost convolution on the periphery of the driven wheel. In addition, an antifriction pad is mounted at the pulling-out position of the tape wound on the outer periphery of the above described driven wheel, while, an engaging slit for leading out the tape is installed on the smooth sheet. In the endless tape cartridge, the tape passes through the engaging slit smoothly to be pulled out.

3,612,423
ROLLED PAPER DISPENSER

Erwin B. Bahnsen, Oakbrook, Ill., assignor to Steiner American Corporation, Salt Lake City, Utah

Filed Jan. 26, 1970, Ser. No. 5,610
Int. Cl. B65h *19/04*
U.S. Cl. 242—55.42 **28 Claims**



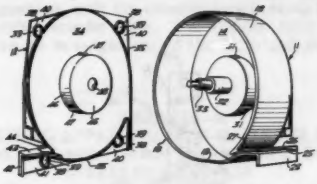
There is disclosed a tissue dispenser comprising a wall-mounted casing having connected thereto a vertically depending tubular spindle, cam mechanism within the spindle including a pair of balls movable between a retracted position therewithin and an extended position protruding therefrom, a lock for locking the balls in the extended position, and a pair of part-cylindrical arms disposed about the spindle and hingedly connected to the casing by a toothed collar insertable over the spindle for attachment adjacent to the upper end thereof, the balls in their extended position engaging the inner surfaces of the arms for moving them to a roll-holding position, the lower end of each arm having a flange for holding rolls of tissue thereon when the arms are in their roll-holding position.

3,612,424
STORAGE AND DISPENSING MAGAZINE FOR ROLLED STRIPS OF LIGHT SENSITIZED MATERIAL

Murray Friedel, North Miami Beach, Fla., assignor to Visual Graphics Corporation

Filed Mar. 27, 1970, Ser. No. 23,265
Int. Cl. G03b *1/04*
U.S. Cl. 242—71.1 **10 Claims**

A container or magazine comprising interfitting, integrally formed magazine body and magazine cover members, each having sidewardly inwardly directed spool holding means for supporting a contained roll of photosensitive strip material is described. Lighttight interfitting engagement is achieved by the reception of peripheral edge portions of the body member in a complemental groove in the cover member, and permanent and rigid interfitting securement is effected by the application of small amounts of a suitable liquid-sealing agent to a plurality of wells or receptacles provided along the path of interfitting engagement, from which the sealing agent flows in each direction along the path of interfitting engagement by capillary attraction. The dispensing slot, extending exteriorly of the magazine, follows a shallow S-shaped path to prevent light piping. The opposite sides of the assembled

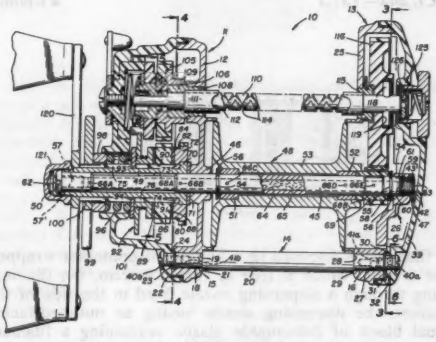


magazine are sufficiently flexible to permit clamping against the opposite ends of a contained roll by means of a central, side-to-side threaded post and thumb nut mechanism which can readily be tightened to secure the roll in place to prevent unraveling of the strip material during transport and storage.

3,612,425
BAIT-CASTING REEL

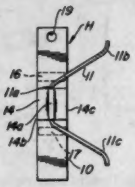
Henry G. Shakespeare, and Gerald Dale Harrington, both of Kalamazoo, Mich., assignors to Shakespeare of Arkansas, Inc., Fayetteville, Ark.

Filed June 23, 1969, Ser. No. 835,382
Int. Cl. A01k *89/04*
U.S. Cl. 242—84.1 R **12 Claims**



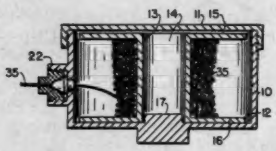
A bait-casting reel. The reel has a head plate and a tail assembly conjoined in spaced relation to provide an integrated, rigid frame. The tail assembly comprises a tail plate and a spider. The spider has a plurality of legs extending radially from a nave, and the legs are detachably mounted to the tail plate radially of a cylindrical access through the tail plate. An arbor is supported through the head plate, and a connecting means anchors the arbor to the nave of the spider so that the arbor can be selectively positionable axially of itself. A line spool is rotatably mounted on the arbor between the head and tail plates, and removable locating means retain the spool in fixed axial relation with respect to the arbor and permit the spool to be selectively removed from the arbor through the cylindrical access. A drive shaft, to which a crank is secured, is rotatably mounted on the arbor exteriorly of the head plate, and a drive train operatively connects the drive shaft to the line spool so that rotation of the former effects multiple revolutions of the latter. A traversing shaft is journaled between the head and tail plates in spaced relation with the line spool. A first gearing means operatively joins the traversing shaft to the drive shaft, and a second gearing means operatively joins the traversing shaft to the line spool. Both the first and second gearing means are solely supported from the rigid frame.

3,612,426
EXTENSION CORD CADDY
John Germock, Jr., 20270 Lake Shore Blvd., Euclid, Ohio
Filed June 11, 1970, Ser. No. 45,320
Int. Cl. B65h *75/36*
U.S. Cl. 242—85.1 **2 Claims**



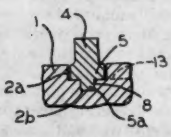
A holder for storing a length of electric cord. Clips on the holder allow it to be attached to and remain with the electric cord when the cord is in use. The holder has a coiling form pivotable to one position for coiling an electric cord thereon and pivotable to another position to be out of the way when the cord is in use with the holder attached thereto. The holder need never be separated from the cord and is always available for storing the cord.

3,612,427
FILAMENT DISPENSER
John M. Bishop, Orange, and Emmet F. Simon, Garden Grove, both of Calif., assignors to The Conolon Corporation
Filed Mar. 2, 1970, Ser. No. 15,451
Int. Cl. B65h *49/18*
U.S. Cl. 242—137.1 **4 Claims**



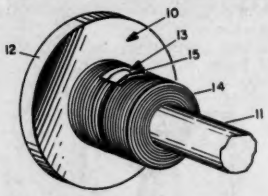
A filament is disposed in a liquidtight container wrapped about a spool which is free to rotate therein, the filament passing through a dispensing nozzle fixed in the side of the container, the dispensing nozzle having an outward-facing conical block of deformable plastic containing a filament passage and the dispensing nozzle also having a pressure plug turned inward about the conical block compressing it about a filament passing therethrough.

3,612,428
TRAVERSE MECHANISM USEFUL IN TEXTILE MACHINES
Rudolf Hohle-Halske, am Stadtwald 30, Remscheid-Lennep, Germany
Filed June 16, 1969, Ser. No. 833,575
Claims priority, application Germany, June 15, 1968, P 17 60 659.6
Int. Cl. B65h *57/28*
U.S. Cl. 242—158.3 **11 Claims**



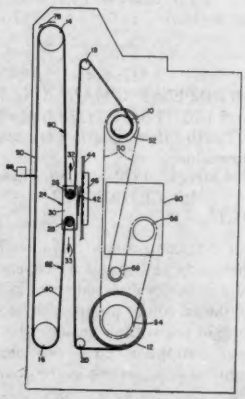
Traverse mechanism for the winding of yarns, threads, and the like on spools with a reciprocating thread guide driven by a compound threaded spindle reciprocally driving a shoe follower with one segment riding in oppositely helical arranged grooves or threads crossing each other at least once and another segment of said shoe follower guiding it through parabolic or arcuate thread reversal segments of cross section different from that of the helical arranged threads.

3,612,429
INSULATED WIRE COIL
Hans A. Koenig, 4313 Joplin Drive, Rockville, Md.
Continuation-in-part of application Ser. No. 871,460, June 19, 1969, now abandoned , Continuation-in-part of application Ser. No. 724,725, Apr. 29, 1968, now abandoned. This application Feb. 11, 1970, Ser. No. 10,600
Int. Cl. B65h *55/00*
U.S. Cl. 242—159 **10 Claims**



A conductive wire coil of insulated wire or cable, stretches of which are wound in opposite directions to minimize inductive effect, in which the wire is paid out internally at high lineal rates of speed without rotating the coil assembly, and which includes protective wire turn pads of soluble material placed at reversal points. The pads are grooved so as to provide 180° turn guides for the wire to insure against breakage of insulation, and are of sufficient thickness to protect the turn loops of wire therein from being cut by overlaid layers. The soluble pads dissolve rapidly upon exposure to sea water during payout so that they do not snarl or cause breakage of wire.

3,612,430
DEVICE FOR FEEDING WEBS IN RECORDING INSTRUMENTS
Reginald E. Freeman, High Wycombe, Buckinghamshire, England, assignor to Instron Corporation, Canton, Mass.
Filed July 23, 1969, Ser. No. 843,930
Claims priority, application Great Britain, July 26, 1968, 35,840/68
Int. Cl. B65h *59/38*; **G03b** *1/04*; **G11b** *15/32*
U.S. Cl. 242—189 **9 Claims**



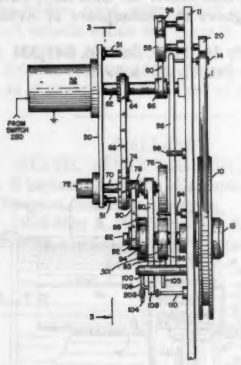
Web-feeding device including web supply and takeup reservoirs mounted for movement to respectively supply and

take up the web longitudinally of the web, a web drive mounted intermediate the reservoirs longitudinally of the web and being actuable to move the web and having an inertia incident to that movement less than the inertia characterizing at least one of the reservoirs in respective movement to supply and take up the web; and a dual loop control in which a pair of loop guides are mounted on a support in spaced relation to each other with the loops extending in generally opposite directions, one guide being intermediate of the supply reservoir and the web drive in a direction longitudinal of the web, the other guide being so intermediate of the web drive and the takeup reservoir, the support being movable toward and away from a generally central position.

3,612,431
TAPE HANDLER WITH ANTIHUNT AND PNEUMATIC REWIND CONTROL

Raymond G. Poland, Holland Patent, and Gerald S. Stevens, Jr., Utica, both of N.Y., assignors to Mohawk Data Sciences Corporation, Herkimer, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,660
Int. Cl. B65h *59/38, 63/02;* G11b *15/32*
U.S. Cl. 242—189 **10 Claims**

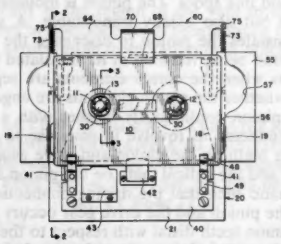


A tape handler having a shiftable drive capstan engageable with the takeup reel shaft under control of the takeup dancer arm employs an antibackup detent acting on the takeup shaft to prevent the takeup reel from oscillating in a hunting-type action when the dancer arm resides in its nominal or rest position. Additionally, pneumatic control means are provided to actuate the tape rewind drive and to simultaneously disable the antibackup detent.

3,612,432
TAPE UNIT CASSETTE HOLDER

Richard M. Johnson, Dallas, Tex., assignor to International Computer Products, Inc., Addison, Tex.

Filed Mar. 3, 1970, Ser. No. 16,170
Int. Cl. G03b *1/04;* G11b *15/32, 23/04*
U.S. Cl. 242—198 **14 Claims**

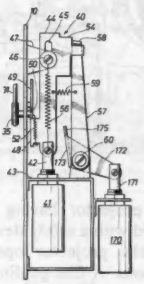


A vertically oriented mounting plate supports an upward facing recording head. The mounting plate includes brackets and guides for locating the cassette both vertically and laterally relative to the recording head and other components. The cassette is received in the holder at an angle from the vertically oriented plate, with its lower edge guided to correct position. Manual urging of the cassette to a position parallel to the plate automatically latches the cassette in operative position, with the cassette spools being positioned over the drive spindle hubs. The spindle hubs give way should there be misalignment of the hubs and the cassette spools.

3,612,433
SWITCHING APPARATUS FOR CASSETTE TAPE-RECORDING EQUIPMENT INCORPORATING AN INTERLOCK SYSTEM

Nelson H. Patton, Jr., Houston, Tex., assignor to Electronic Laboratories, Inc.

Filed Oct. 17, 1969, Ser. No. 867,252
Int. Cl. B11b *15/32;* G03b *1/04*
U.S. Cl. 242—201 **9 Claims**

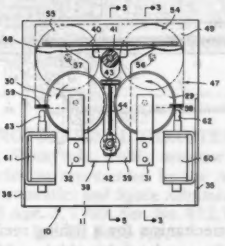


For use with tape-recording equipment preferably using a cassette which has a pair of reels and a magnetic tape, the forward direction of movement of the tape being the record direction and the reverse direction being the rewind or playback direction, the apparatus including electric actuators which pull in and lock the tape-recording apparatus in either the record of the playback mode, the position being held without the continued application of electrical power to the electric actuators, and further including a release electric actuator which unlatches the record and playback actuators, and an interlock system preventing actuation of both modes of operation.

3,612,434
TAPE UNIT DRIVE MECHANISM

Richard M. Johnson, Dallas, Tex., assignor to International Computer Products, Inc., Addison, Tex.

Filed Mar. 2, 1970, Ser. No. 15,581
Int. Cl. B11b *15/32;* G03b *1/04*
U.S. Cl. 242—204 **14 Claims**



A tape unit for cassette-loaded magnetic tape includes a pair of drive wheels including projecting spindles for driving engagement with the cassette spools. The spindles are braked by a brake member which frictionally engages the drive

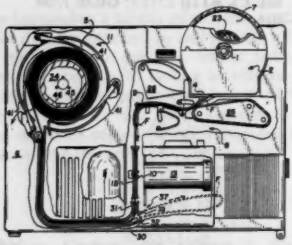
wheels. Drive shafts, for selective driving engagement with the drive wheels, are rotatably mounted on a pivot frame which also supports the respective drive motors. Solenoid plungers selectively rock the pivot frame to engage one or the other of the drive shafts with a respective drive wheel; and cam means associated with the pivot frame disengage the brake in either drive position.

3,612,435

SAFETY DEVICE FOR A MOTION-PICTURE PROJECTOR HAVING AN ENCLOSED TAKEUP MECHANISM

Robert J. Roman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 22, 1969, Ser. No. 852,406
Int. Cl. B11b *15/32*; G03b *1/04*
U.S. Cl. 242—205 6 Claims



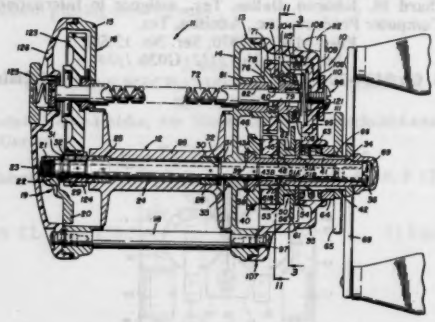
A motion-picture projector having an enclosed takeup mechanism is provided with a safety device which avoids film damage and alerts the projector operator if the takeup mechanism malfunctions. A film guiding passageway leading to the film takeup mechanism is provided with an aperture through which film may escape to the exterior of the projector housing when the film is caused to buckle in a takeup malfunction.

3,612,436

FREE SPOOL MECHANISM

Henry G. Shakespeare, and Gerald Dale Harrington, both of Kalamazoo, Mich., assignors to Shakespeare of Arkansas, Inc., Fayetteville, Ark.

Filed June 23, 1969, Ser. No. 835,639
Int. Cl. A01k *89/02*
U.S. Cl. 242—216 10 Claims



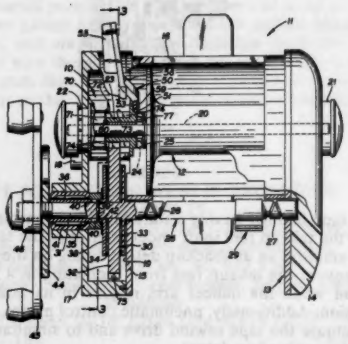
A free spool mechanism for a fishing reel. The free spool mechanism employs a clutch by which a driving connection between two rotatable members in the drive train operatively joining the crank and line spool can be selectively disengaged and automatically reengaged upon rotation of the crank. The clutch has opposed, interfitting clutch elements, one mounted to rotate with one member of the drive train and the opposed clutch element mounted to rotate with another member of the drive train. A throwout means is selectively operative to separate said clutch elements for disengaging the driving connection therebetween. The throwout means also maintains the clutch elements separated until a trip means operates in response to rotation of the crank to reengage the driving connection between the clutch elements. The trip means may be provided with a finger mounted for resilient movement through a predetermined range. Because of the resilient mounting, even interaction of the finger with the throwout means while the throwout means is being actuated to separate the clutch elements does not block the clutch elements in engaged position and/or result in untimely reengagement of the clutch elements. This desirable result obtains irrespective of whether or not the reel is provided with an antireverse mechanism. Nevertheless, predetermination of the range through which the finger is yieldingly movable assures reengagement of the clutch elements, when desired.

3,612,437

FREE SPOOL MECHANISM

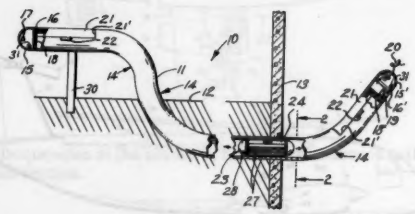
Franze E. Allebach, and Lester H. Courtney, both of Fayetteville, Ark., assignors to Shakespeare of Arkansas, Inc., Fayetteville, Ark.

Filed July 14, 1969, Ser. No. 841,331
Int. Cl. A01k *89/00*
U.S. Cl. 242—216 3 Claims



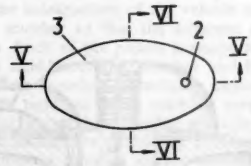
A free spool mechanism for a fishing reel. The free spool mechanism employs a clutch by which a driving connection between two rotatable members in the drive train operatively joining a crank and line spool can be selectively disengaged and automatically reengaged upon rotation of the crank. The clutch has opposed, interfitting clutch elements, one mounted on a pinion and the opposed clutch element mounted on said line spool. The pinion is mounted to be not only rotatable but also axially translatable. A shift means selectively translates the pinion to disengage the clutch elements, the pinion being retained in its translated position by gripping means when the clutch elements are separated. Irrespective of whether the clutch elements are engaged or disengaged, the pinion continuously meshes with a drive gear operatively connected to revolve in response to rotation of the crank. The teeth on the pinion and drive gear are of the helical variety and the helical teeth on the pinion are selected to present a hand such that the driving connection between the teeth on the pinion and the drive gear occurs only on the sides of the pinion teeth distal with respect to the clutch element mounted on the pinion when the crank is rotated to retrieve line. As such, reengagement of the clutch elements is occasioned solely by a component of the pressure applied by the teeth on the drive gear against the teeth on the pinion.

3,612,438
PNEUMATIC TRANSPORT APPARATUS
Charles Herndon, 9 John, Shelbyville, Ind.
Filed Nov. 6, 1969, Ser. No. 874,667
Int. Cl. B65g *51/32*
U.S. Cl. 243—19 2 Claims



A device for transporting mail in cities, suburbs, and rural districts. This device utilizes fins in order to stabilize it in travel within hollow rigid tubes which extend underground. The transport vehicle within the tubes is of such structure so as to easily navigate turns in the tube and included on the vehicle are flexible rings which engage the interior surface of the tube so as to cause little or no loss of air compression.

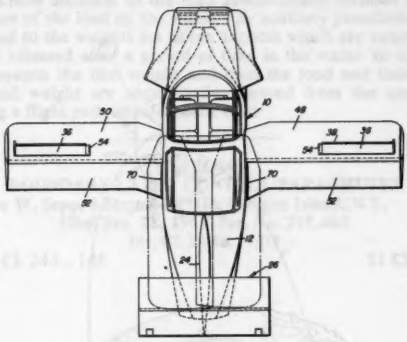
3,612,439
STATIC VENTS FOR AIRCRAFT
Philip John Wingham, Bath Bai, England, assignor to Avimo Limited, Taunton, Somerset, England
Filed May 1, 1969, Ser. No. 820,885
Claims priority, application Great Britain, May 2, 1968, 20800/1968
Int. Cl. B64d *43/02*
U.S. Cl. 244—1 R 2 Claims



Certain aircraft instruments are dependent on static pressure readings derived from a static vent. It is necessary for accuracy that the reading at the static vent shall be independent of airspeed. In order to enable this to be achieved there is provided an aircraft or part thereof including a static vent, the smooth aerodynamic shape of the aircraft or part being modified locally in the region of the vent to modify the airflow thereover in operation so as substantially to compensate the position error arising from variation in Mach number.

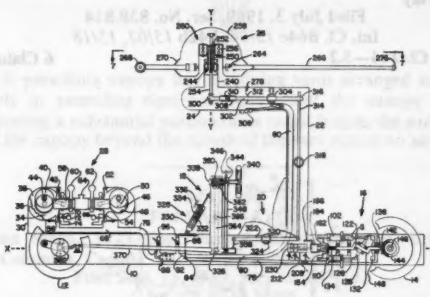
3,612,440
WARP ACTION SPOILER PLATE AILERON AND COMBINED AIRPLANE AND AUTOMOBILE
Richard A. Strong, 6106 Hope Drive, Washington, D.C.
Filed Sept. 4, 1969, Ser. No. 855,084
Int. Cl. B64c *37/00*
U.S. Cl. 244—2 9 Claims

The invention relates to an aircraft having roadability features and includes wing structures which fold from operative positions to inoperative positions nested within the body of the aircraft. The wing has a warp action spoiler plate aileron in it and has a full span flap which, with the wing, may be swung into



overlapping position in the fuselage with the other wing similarly positioned. It is an improvement on my prior U.S. Pat. No. 2,923,494 of Feb. 2, 1960.

3,612,441
COMBINED LAND AND AIR VEHICLE
John Abramopaulos, 24-29 42nd St., Long Island City, N.Y.
Filed May 12, 1969, Ser. No. 823,639
Int. Cl. B64c *37/00*
U.S. Cl. 244—2 7 Claims

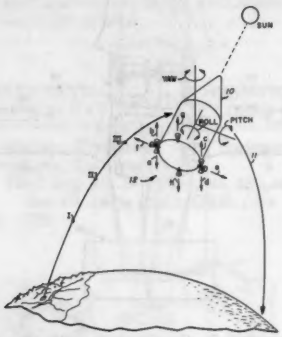


A land air vehicle comprising a chassis in which is journaled a pair of front steerable wheels and rear driven wheels, a superstructure mounted to said chassis journaling a helicopter rotor assembly, a compressor for creating a supply of pressurized air, a pneumatic motor coupled to the rear wheels, which motor is driven by the compressed air, and a jet propulsion system coupled to the rotor assembly also driven by said compressed air. The vehicle includes control means for selectively operating one or the other of the pneumatic motor or jet propulsion system in manual or automatic operation.

3,612,442
FLUIDIC PROPORTIONAL THRUSTER SYSTEM
Dean M. Chisel, Sunnyvale, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Apr. 3, 1969, Ser. No. 812,998
Int. Cl. F42b *15/18*
U.S. Cl. 244—3.22 2 Claims

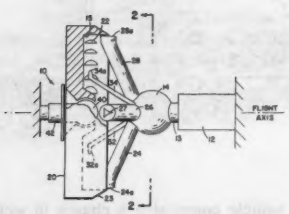
A proportional thruster system utilizing a fluidic vortex apparatus as means for controlling the continuous flow of gases supplied to a plurality of thrusters in response to detected vehicle attitude error signals. Continuous variable thrust for

attitude control applications is provided by the flow of gas to a plurality of thruster nozzles through modulated vortex ele-



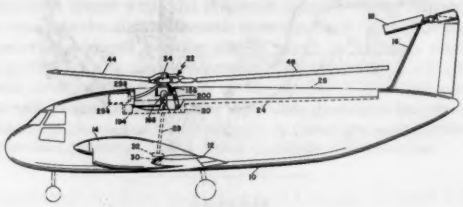
ments. The thruster system is responsive to electronic or fluidic sensed attitude error, sensors, and logic.

3,612,443
THRUST-PRODUCING GYRO SYSTEM
William W. Stripling, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army
Filed July 3, 1969, Ser. No. 838,814
Int. Cl. B64c *15/04*; F42b *15/02, 15/18*
U.S. Cl. 244—3.2 **6 Claims**



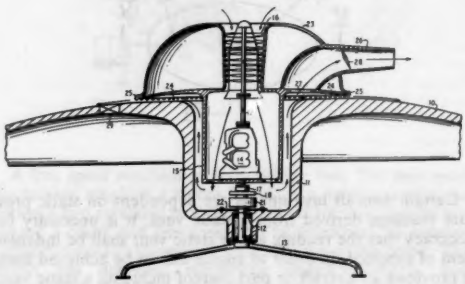
A thrust-producing gyro system for attitude control of missiles. The gyro system guides a missile along a path determined by the attitude of a space-oriented rotating wheel without using intermediate amplifiers. The gyro system includes a hot gas source that supplies gas to a housing enclosing a plenum chamber. The chamber has a pair of tubular members radially disposed for providing gas flow to the inner surface of a high-momentum wheel for rotation thereof. Additional tubular members extend radially from the plenum chamber to terminate adjacent the interior annular surface of the high-momentum wheel and provide gas flow which is exhausted from the tubes at ports in the missile skin adjacent the end of each tube. The output gases spin the wheel at a high momentum. The rotating wheel covers a portion of each tube outlet so that relative motion between the missile and wheel varies the gas escaping from each tube, increasing the gas escaping from one port while decreasing the gas escaping from an opposing port, and thereby provides a restoring force to the missile.

3,612,444
CONTROLLED CIRCULATION STOWABLE ROTOR FOR V/STOL AIRCRAFT
Peter F. Girard, La Mesa, Calif., assignor to Ryan Aeronautical Company, San Diego, Calif.
Filed Nov. 10, 1969, Ser. No. 875,226
Int. Cl. B64c *27/22*
U.S. Cl. 244—7 **16 Claims**



A stoppable helicopter-type rotor is provided with means to blow air angularly outward toward the leading and trailing edges, above and below each rotor blade. The rotor includes means to stop and fold the blades and stow the folded structure in an enclosure in an aircraft, the air blowing being used during transition between vertical and horizontal flight modes to spoil the lifting effect of the blades during stopping of rotation of the rotor and so eliminate the blade-bending loads which are a major problem with stoppable rotors.

3,612,445
LIFT ACTUATOR DISC
Duan Arthur Phillips, 123 Marshall St., Kotara Heights, New South Wales, Australia
Filed Nov. 5, 1968, Ser. No. 773,462
Int. Cl. B64c *29/00*
U.S. Cl. 244—12 C **11 Claims**

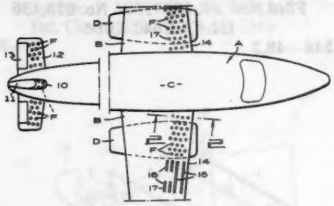


A machine such as an aircraft in which lift is produced by directing a fluid such as air in a radial direction along the surface of a disc which is rotated about its polar axis.

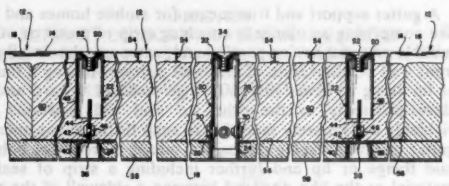
3,612,446
MEANS AND METHOD FOR PREVENTING THE FORMATION OF AUDIBLE FREQUENCIES IN FLUIDS PASSING OVER AN AIRFOIL SECTION
Herbert A. Lebert, 8 Corte Dorado, Millbrae, Calif.
Filed Oct. 10, 1969, Ser. No. 865,305
Int. Cl. B64c *3/04*
U.S. Cl. 244—35 **8 Claims**

Means and method for preventing the formation of audible

frequencies in fluids passing over an airfoil section in which the potential audible frequencies are converted into inaudible frequencies at the source of the fluid disturbance with the airfoil section.

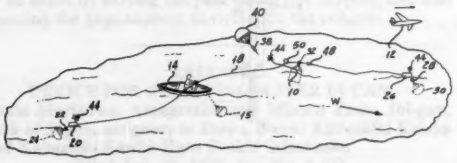


3,612,447
EXTERNAL SURFACE STRUCTURE FOR HYPERSONIC VEHICLES
Gail S. Newsom, Studio City, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Jan. 2, 1969, Ser. No. 788,393
Int. Cl. B64c *1/38*
U.S. Cl. 244—117 **15 Claims**



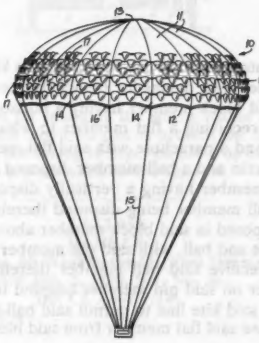
An external surface structure construction is disclosed which is intended to be utilized in hypersonic vehicles such as aircraft. This structure includes a plurality of panels spaced from the substructure of the vehicle and located adjacent to one another so that the adjacent edges of these panels overlap. Each of the panels is supported on the substructure by a rigid mounting member and by at least one flexible mounting member permitting expansion of each panel about the rigid mounting member employed with it. Preferably a plurality of these flexible mounting members are used with each panel. The panels are preferably as large as can be conveniently handled during assembly and maintenance operation.

3,612,448
AERIAL DELIVERY SYSTEM
Leonard P. Frieder, Clarks Green, Pa., assignor to Gentex Corporation, New York, N.Y.
Filed Jan. 23, 1970, Ser. No. 5,278
Int. Cl. B64d *1/02*
U.S. Cl. 244—138 R **12 Claims**



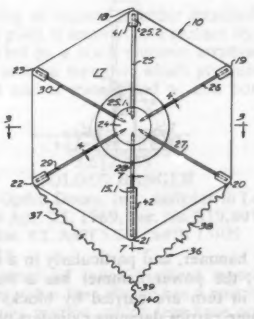
An aerial delivery system for delivering a load of supplies or the like to a boat at sea from an aircraft in which respective buoyant weights carrying marker lights and having small parachutes attached thereto are secured to the ends of a buoyant guideline which slidably receives a ring attached to the load for movement to a position between spaced stops on the line at a location intermediate the line ends. A larger parachute attached to the load automatically releases upon impact of the load on the water. The auxiliary parachutes attached to the weights act as sea anchors which are automatically released after a period of time in the water. In use of the system the first weight and then the load and then the second weight are sequentially released from the aircraft along a flight path upwind of the boat.

3,612,449
BOUNDARY LAYER CONTROL PARACHUTES
Oscar W. Sepp, 1 Mansion Drive, Morgan Island, N.Y.
Filed Jan. 15, 1969, Ser. No. 791,401
Int. Cl. B64d *17/02*
U.S. Cl. 244—145 **21 Claims**



A parachute canopy has narrowing vents arranged annularly in ascending tiers uniformly about the canopy and covering a substantial portion of its radial length; the surface of the canopy beyond the mouth of the vent acts as an airfoil.

3,612,450
FOLDABLE KITE
John Sinka, 3823 East Hasting, North Burnaby, British Columbia, Canada
Filed Sept. 15, 1969, Ser. No. 857,693
Int. Cl. B64c *31/06*
U.S. Cl. 244—153 **5 Claims**

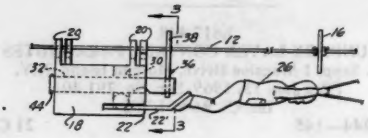


Kite with demountable framework of radial frame members secured in slots of a center disc. Cap screwed on core of disc clamps inner ends of frame members in disc. Lifting element with pockets accepting outer ends of frame members; when frame members assembled tightening of cap stretches lifting element taut on demountable framework.

3,612,451
PARACHUTE RELEASE DEVICE

James N. Wharton, 1124 Carissa Drive, Tallahassee, Fla.

Filed Sept. 12, 1969, Ser. No. 857,381
Int. Cl. B64c 31/06
U.S. Cl. 244—155 R 6 Claims

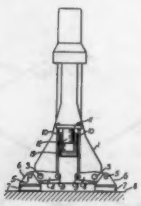


A parachute release device for use with a kite comprising a block member with means for detachably connecting it to a kite line, said block member having a horizontal slot therein for slidably receiving a flat member to which is attached a parachuter and a parachute with said flat member having an opening therein and a ball member disposed in said opening, said block member having a vertically disposed slot therein with said ball member being disposed therein, a slidable pin member disposed in said block member above said vertically disposed slot and ball, with said pin member having a detent therein to receive said ball member therein, and a release wire member on said pin member adapted to contact a stop member on said kite line to permit said ball to enter said detent to release said flat member from said block member.

3,612,452
POWER HAMMER

Pavel Harvanke, Brno, Czechoslovakia, assignor to Vyzkumny ustav tvarecich Stroju a technologie tvareni, Brno, Czechoslovakia

Filed Oct. 8, 1969, Ser. No. 864,581
Int. Cl. F16f 15/00
U.S. Cl. 248—20 4 Claims

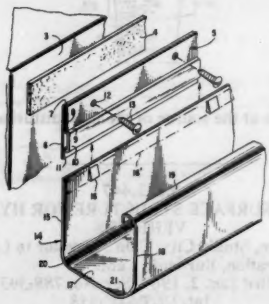


In a power hammer, and particularly in a mounting structure therefor, the power hammer has a frame carried by levers which in turn are carried by blocks mounted on a floor. The frame carries damping cylinders pistons which act on a shock-absorbing damping medium within the cylinders. A transmission extends between the levers and the pistons to cause the latter to tend to move into the cylinders to provide shock absorption by the damping medium in the cylinders when the ram of the hammer strikes against work carried by an anvil of the hammer. In this way, the frame is situated over and out of engagement with a floor which is protected against injury.

3,612,453
GUTTER SUPPORT AND TRIM MEANS FOR MOBILE HOMES AND THE LIKE

Ernest C. Zimmer, R.D. #2, Wellsburg, N.Y.

Filed Nov. 19, 1969, Ser. No. 878,130
Int. Cl. E04d 13/06
U.S. Cl. 248—48.2 10 Claims



A gutter support and trim means for mobile homes and the like comprising an elongate attaching strip of metal or other suitable material having parallel and juxtaposed backwall and front wall portions, one of said wall portions having a flange or lip along its lower marginal edge directed toward and in close proximity to the other of said wall portions for yieldably but securely receiving in snap-fitting engagement a gutter backwall having disposition means thereon for behind said flange or lip and further including a strip of sealing material or the like disposed between a sidewall of the mobile home or the like and the attaching strip. Screws or other suitable fastening means hold the attaching strip to the mobile home or the like.

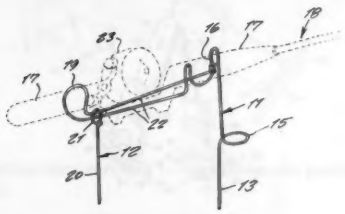
3,612,454
FISHING ROD HOLDER

Frank F. Linn, 3049 W. 8th, Los Angeles, Calif., assignor to Frank F. Linn, Jr.

Filed Sept. 11, 1969, Ser. No. 857,009
Int. Cl. A01k 97/10; E04h 12/22
U.S. Cl. 248—42 5 Claims

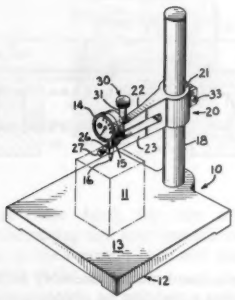
A universally mounted resilient helix dimensioned for receipt and support of the butt of a fishing rod in combination with a quick detachable mounting means for selectively stationing the holder for and during fishing.

3,612,455
FISHING POLE HOLDER
Charles G. Cole, and Judy I. Cole, both of P. O. Box 147, Sheldon, Mo.
Filed Dec. 1, 1969, Ser. No. 881,262
Int. Cl. A01k 97/10; A45f 3/44
U.S. Cl. 248—44 2 Claims



A holder for supporting a fishing pole, the holder comprising a pair of wire members which are bent into particular shapes and attached together to form a unitary assembly, each wire having one end extended downwardly to form a leg which can be inserted into the ground or sand while the opposite ends of the wires serve to support the fishing pole thereupon during fishing.

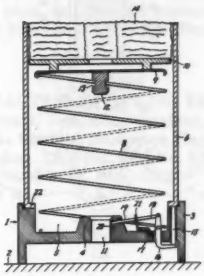
3,612,456
SUPPORT DEVICE FOR MEASURING GAGES
William V. Palmer, 11841 Franklin Ave., Franklin Park, Ill.
Filed Oct. 3, 1969, Ser. No. 863,438
Int. Cl. A47g 29/00; G01b 5/28
U.S. Cl. 248—125 5 Claims



A support device for measuring gages is provided, which accurately and securely locates a measuring gage in a desired position. The device comprises an integrally formed fork-shaped member, adapted to be mounted on an upstanding column and having two tines, one of which supports the measuring gage. An adjusting screw, carried by the other tine deflects the gage-supporting tine up or down over a small range of distances for accurately locating the gage plunger in a desired position. Coarse adjustments of the gage plunger may be made by moving the gage on its tine support, and also by moving the gage support device upon the column.

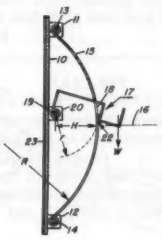
3,612,457
DEVICE FOR RECEIVING SLIVER IN CAN
Takashi Morikawa, Amagasaki, and Minoru Endo, Ibi-gun, both of Japan, assignors to Daiwa Boseki Kabushiki Kaisha and Kabushiki Kaisha Hara Shokki Seisakusko
Filed Jan. 28, 1970, Ser. No. 6,477
Claims priority, application Japan, Feb. 10, 1969, 44/9935
Int. Cl. B65g 1/16
U.S. Cl. 248—128 3 Claims

A device for supporting a sliver as it is fed into a can. A can support is positioned in a sliver-feeding location, and is adapted to support a sliver can. A spring supports a sliver-receiving plate within the sliver can, and in turn is supported on the can support. A sensing element is provided in the can support which senses the presence or absence of a can, and is



coupled to means for retaining the spring within the support under compression when no can is present on the support, and for releasing the spring to urge the plate upwardly within a can when a can is positioned on the support.

3,612,458
HANGER
Bakari Mwanyoha, 40 Washington St., East Orange, N.J.
Filed Jan. 2, 1970, Ser. No. 36
Int. Cl. A47f 7/14
U.S. Cl. 248—205 A 5 Claims

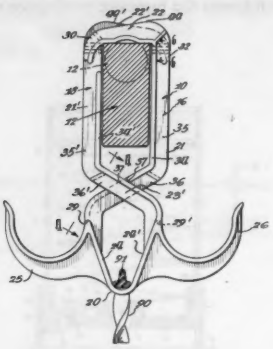


A hanger having an arcuate member attached to a mounting plate, which plate is secured to a surface by an adhesive. The load is carried by a hook member arranged to apply a pressure to the arcuate member, which pressure varies with the load weight and is transmitted to end portions of the mounting plate.

3,612,459
MOLDED HANGER
Leroy C. Walls, Ogden Dunes, Ind., assignor to Lewals, Inc.
Filed Apr. 25, 1969, Ser. No. 819,401
Int. Cl. A47f 5/00; A47b 15/00
U.S. Cl. 248—215 13 Claims

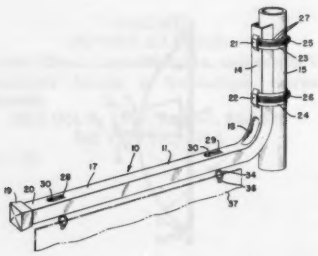
A hanger formed of tough resilient material such as polycarbonate or nylon-type plastic has a pair of legs joined at a bight or hinge portion, which legs have portions which cross over each other short of said bight portion and have other portions which terminate in inwardly directed juxtaposed end portions which are adapted to transmit the load on the hanger to a suspended support. The juxtaposed end portions of the various embodiments have latching means which when operative serve to resist unwinding or twisting of said legs during excessive loading of the hanger. Certain embodiments of the hanger have interengaging means on each arm which resist unwinding or twisting of said legs. Hooks or

other article-engaging means are formed integrally with the legs in the vicinity of the hinge portion. A separate hook



member may be provided for suspended attachment to the bight or hinge portion of the hanger.

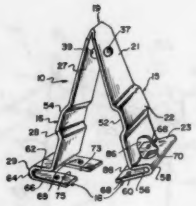
3,612,460
SIGN SUPPORT
Harvey J. Smith, Greensboro, N.C., assignor to Modern Metal Products Company, Inc., Greensboro, N.C.
Continuation-in-part of application Ser. No. 749,124, July 31, 1968, now abandoned. This application Dec. 4, 1969, Ser. No. 881,967
Int. Cl. G09f *7/16*
U.S. Cl. 248—221 **6 Claims**



A pole-mounted sign support in which an L-shaped channel is secured to a pole along one leg and a sign is supported along the other horizontal leg with means along one leg for supporting a sign to a pole and means along the horizontal leg for supporting a sign thereon.

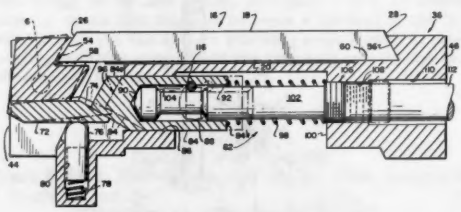
3,612,461
LIGHT FIXTURE SUPPORTING CLIP
William R. Brown, Carol Stream, Ill., assignor to Minerallac Electric Company, Chicago, Ill.
Filed Apr. 20, 1970, Ser. No. 29,953
Int. Cl. E04b *5/52*; E06b *3/54*
U.S. Cl. 248—317 **10 Claims**

The clip includes first and second metal strip sections which are formed by bending a metal strip about a centrally located fold line and which are formed with a configuration to closely fit about opposite sides of an inverted T-shaped grid member of a false ceiling supporting structure in a building structure. The lower end portions of the strip sections extend laterally below the grid member in overlapping relationship to each other with one end portion having a square opening and the other end portion having a slot aligned with the opening. A stud having a head and a shank is received in the opening with the head disposed between one of the end portions and the bottom side of the grid member and with the shank extending through the opening and the slot. The upper end portion of each of the strip sections has a hole therein and the holes register with each other to form an aperture through which a drop wire is received for securing one end of the wire to the clip. The other end of the drop



wire is secured to the building structure so that a light fixture, mounted by a threaded fastener to the stud extending from the clip, is supported by the building structure solely through the clip and drop wire and does not bear upon or load the grid member.

3,612,462
INSTRUMENT MOUNT ASSEMBLY
Paul C. Mooney, Northbrook, and Howard Emmett Shelley, Niles, both of Ill., assignors to Quick-Set Incorporated
Filed Aug. 26, 1969, Ser. No. 853,099
Int. Cl. A47g *29/00*; F16m *1/100*
U.S. Cl. 248—346 **16 Claims**

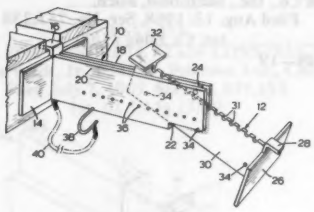


An improved instrument mount assembly including a plate and base for securing a sighting or photographic equipment to a support, the assembly being characterized by a pivoted clamp bar in the base, which, when engaged by an instrument bearing the plate element thereon, automatically retracts to an instrument retaining position. A locking latch is associated with the clamp bar to lock the same to tightly clamp the plate and hold the instrument against any movement relative to the mount following emplacement of the sighting or camera instrument thereon.

3,612,463
WEDGING DEVICE FOR PALLET LOADS
Andrew Grant, 81 Drakefield Road, Markha, Ontario, Canada
Filed Sept. 2, 1969, Ser. No. 854,450
Claims priority, application Canada, Feb. 6, 1969, 42,123
Int. Cl. F16f *15/04*
U.S. Cl. 248—354 P **6 Claims**

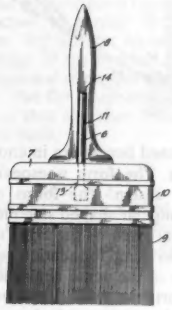
A device for wedging pallet loads comprising a two-part extensible brace, a first part of the device consisting of a pair of side-by-side parallel plates fixed together along their bottom edges and having an end plate carrying means for securing the first part to the pallet, the second part of said device being a single plate member fitted between the two side

plates of the first part. The first and second parts are adapted to cooperate with one another by means of a releasable pin



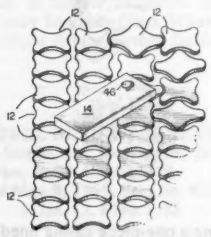
and complementary coupling to secure adjacent portions of a pallet load.

3,612,464
BRUSH SUPPORT HOOK
John L. Harrah, 79 West Glendale, Bedford, Ohio
Filed Aug. 4, 1969, Ser. No. 855,066
Int. Cl. A46b *17/00*
U.S. Cl. 248—360 **1 Claim**



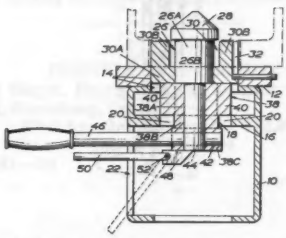
A one-piece wire hook for use on paint, varnish, whitewash, kalsomining and associated brushes. A wire hook that will assist in their proper care and one to prevent contorting or sloping of the bristles.

3,612,465
SUPPORTING APPARATUS FOR USE IN A GRAVITY-FREE ENVIRONMENT
Lloyd O. Barrett, 340 N. Stone St., Deland, Fla.
Filed Aug. 1, 1969, Ser. No. 846,809
Int. Cl. A63c *19/10;* **A63j** *5/00;* **B65j** *1/22*
U.S. Cl. 248—361 R **11 Claims**



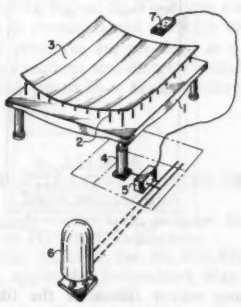
Apparatus for stably orienting an animate or inanimate body with respect to a surface, particularly suited for use in a gravity-free environment. A plurality of multilobed support disks are rotatably mounted on the surface to define glide paths. A glide plate, to which the person or other body to be stably oriented is attached, includes a clamping disk having a stem which is movable within the glide paths when the clamping disk is in its released position. At the location at which it is desired to stably orient the person or other body, the clamping disk is moved to its clamped position, thereby holding the glide plate and thus the person or other body in stable orientation with respect to the surface.

3,612,466
RETRACTABLE LOCKING DEVICE
Arthur James Arnold, Doncaster, England, assignor to Container Twistlocks Limited, Doncaster, England
Filed Aug. 29, 1969, Ser. No. 854,221
Int. Cl. B65j *1/22*
U.S. Cl. 248—361 R **2 Claims**



A locking device for a vehicle platform comprising a locking member with a horizontal lug adapted to engage in a slot in a container on the platform in a first position and which can be released from locking engagement by twisting the locking member and then lowering the same to a second position.

3,612,467
POSITIONING DEVICE FOR STRUCTURAL MEMBERS
Kiyoshi Terai, Ashiya-shi, and Tatsumi Kurioka, Kobe-shi, both of Japan, assignors to Kawaki Jukogy Kabushiki Kaisha, Ikuta-ku, Kobe, Japan
Filed Mar. 27, 1969, Ser. No. 811,050
Claims priority, application Japan, Apr. 3, 1968, 43/21978
Int. Cl. F16m *13/00*
U.S. Cl. 248—396 **2 Claims**

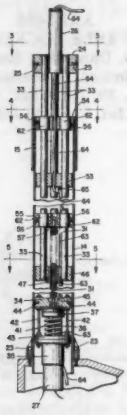


A positioning device in the form of a steel surface plate is supported by individual supporting means, each capable of raising or lowering the plate and control means to operate the spacing means individually or in various combinations for inclining at various angles to facilitate assembling or welding of structural members carried on the upper surface thereof.

3,612,468
HEIGHT ADJUSTING MEANS FOR A SURGICAL MICROSCOPE

Josef K. Hoppl, and Helmut A. Golda, both of Lindenhurst, N.Y., assignors to J. K. Hoppl Corporation, Lindenhurst, N.Y.

Filed Oct. 13, 1969, Ser. No. 865,751
Int. Cl. F16m 11/04
U.S. Cl. 248—405 6 Claims

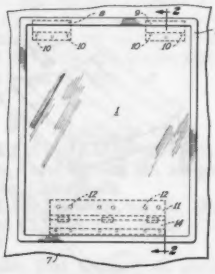


An improved surgical microscope particularly useful in ophthalmic surgery of the type comprising a base member, an adjustable support column extending upwardly therefrom and means projecting from the support column to suspend the optical components of a microscope and related auxiliary equipment above the operating area. The improvement resides in a novel arrangement of structural elements providing an adjustable support column which is advantageously integrated with other structural components of the microscope.

3,612,469
THEFT-PROOF WALL-HUNG MOUNTING FOR MIRRORS AND THE LIKE

Harry F. Dennis, Cincinnati, Ohio, assignor to The F. H. Lawson Company, Cincinnati, Ohio

Filed Oct. 10, 1969, Ser. No. 865,460
Int. Cl. A47f 7/14
U.S. Cl. 248—475 R 4 Claims

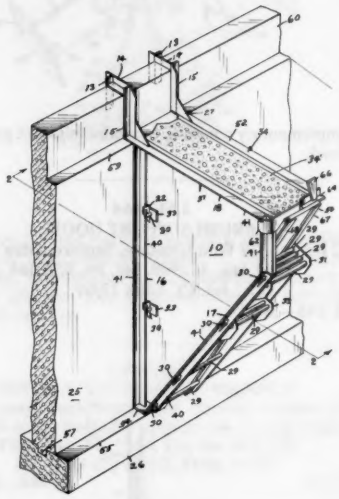


A wall-hung mirror frame or the like adapted to be suspended from one or more frame engaging hangers, the rear of said frame being provided with a resilient locking bracket having an inturned flange selectively engageable with a series of louvers formed in a catch hanger affixed to the wall, the parts being positioned so that the locking bracket and catch hanger, when interengaged, will fixedly secure the frame so that it cannot be removed from the frame hangers.

3,612,470
WALL FORM

Tony Car, Troy; Mike Milkovich, Allen Park, and Ante Ivosic, Allen Park, all of Ill., assignors to Tru-Wall Construction Co., Inc., Southfield, Mich.

Filed Aug. 13, 1968, Ser. No. 752,238
Int. Cl. E04g 11/00
U.S. Cl. 249—19 3 Claims



The forms disclosed herein are intended for use in making porch foundations. The form is especially suitable for use with precast wall design. The forms are made up of two generally right triangular shaped side members each having a hook at one side of each of the right angles, suitable to be hooked over an existing foundation wall. One end of the form adjacent one of the acute angles is suitable to rest on a footing that supports the wall. A unique arrangement of the forms made up of an edge and clamp arrangement is provided which rigidly holds the side members together.

3,612,471
TURNABLE HOT TOP AND LIFTING FORK

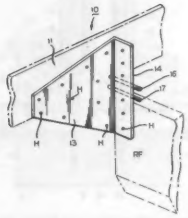
Donald C. Atkinson, Ellwood City, Pa., assignor to Universal Refractories Corporation, Milwaukee, Wis.

Continuation of application Ser. No. 668,010, Sept. 15, 1967, now abandoned. This application Oct. 13, 1969, Ser. No. 865,937
Int. Cl. B22d 7/10
U.S. Cl. 249—202 4 Claims

A hot top having a one-piece casing lined with a heat insulating lining and having a single-use refractory bottom ring assembly secured to the bottom of the casing to support the lining. The casing is provided with an elliptical lifting lug integral with the outside surface of each of the side and end

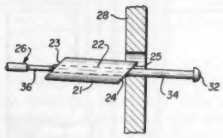
walls of the casing and a round turning trunnion integral with each of the lifting lugs. The casing is lifted by a lifting yoke having lifting surfaces corresponding to the surfaces of the lifting lugs.

3,612,472
GAUGE FOR CONCRETE STAIR CONSTRUCTION
Henry Steigerwaldt, Jr., 6341 W. Peterson Ave., Chicago, Ill.
Filed July 7, 1969, Ser. No. 839,193
Int. Cl. E04g *13/00*
U.S. Cl. 249—208 **3 Claims**



A gauge for concrete stair construction comprising a stringer extending in a direction corresponding to the rise and run of the completed stair, a plurality of flat gauge brackets secured to the stringer, each bracket having an edge extending in a direction, generally vertical, and bearing against the riser form, the bracket having spacer structure secured to the rear edge of the bracket and contacting the underside of the stringer and the upper edge of the riser form to hold same in place. The flat gauge brackets may be rocked in a vertical plane, so that the riser form may be given a desired amount of kick back.

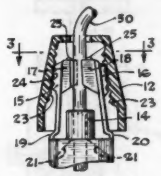
3,612,473
CONE OR PLUG FOR FORM TIES
James W. Franklin, P.O. Box 3646, Albuquerque, N. Mex.
Filed Mar. 13, 1969, Ser. No. 806,858
Int. Cl. E04g *17/06*
U.S. Cl. 249—213 **5 Claims**



A spacer, cone or plug device for use with form ties to prevent escape of concrete which provides a resilient tubular body for closely engaging form ties and an angular end face to facilitate useage. The end face operates as a guide and self-finding element when the forms are erected; as a convenient gripping element when the device is removed from a poured wall; and, it further preserves an opening in the poured wall that may be easily filled. When used with break-back ties, the resilient device further facilitates the breaking away of tie ends.

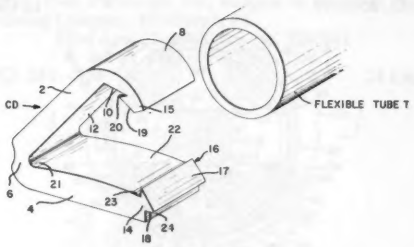
3,612,474
FLOW CONTROL DEVICE FOR FLEXIBLE TUBES
Clair Laffayette Strohl, Jr., Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed May 9, 1969, Ser. No. 823,460
Int. Cl. F16k *7/06*
U.S. Cl. 251—9 **5 Claims**

A flow control device for flexible tubing to control and regulate the rate of flow of fluid through the tubing and comprising at least a pair of movable jaws engageable with the tubing and affixed to one member and a second member engageable with the jaws and movable along the longitudinal axis of the first member to thereby move the jaws into and out of engagement with the tubing when the second member



is moved along the axis of the first member. The flow control device is particularly useful in administering liquids for intravenous feeding and other medical purposes.

3,612,475
FLEXIBLE TUBE CLOSURE
Leon Joel Dinger, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Apr. 2, 1969, Ser. No. 812,811
Int. Cl. F16k *7/04*
U.S. Cl. 251—10 **1 Claim**

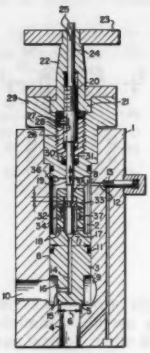


Tube closure devices comprising bendable members, each having a pair of arms connected together by integral hinges are disclosed. Coacting latch arrangements are disposed on the extending ends of the arms to latch the arms over sections of flexible tubes which are placed under compression via the closure devices. Raised floor sections on at least one of the arms serve to compress and sealingly close the tube such that residual pressures are provided in a closure. Alternate curved floor sections also assure a sealed closure and provide strain relief means in a closure where the flexible tubes join closure devices.

3,612,476
APPARATUS FOR ACTUATING CLOSURE ORGANS FOR HIGH PRESSURES
Anton Leitgeb, Aesch, Switzerland, assignor to Maschinenfabrik Burckhardt AG, Basel, Switzerland
Filed May 22, 1969, Ser. No. 826,829
Claims priority, application Switzerland, May 23, 1968, 7620/68
Int. Cl. F16k *31/383*
U.S. Cl. 251—38 **1 Claim**

A piston moves within a bore in a valve housing to open and close an inlet and outlet port. One face of the piston is directly responsive to the pressure of a working fluid while the other face thereof is simultaneously responsive to the working fluid received through a diverting duct. A spindle is

directly connected to the piston to move the same. The piston is provided with a fluid relief duct operable by the

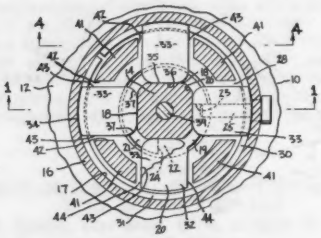


movement of the spindle to create a pressure differential on the faces of the piston to enhance movement.

3,612,477
SELF-LOCKING VALVE WITH UNITARY LOCKING ELEMENT

George G. Allenbaugh, Jr., Rittman, Ohio, assignor to Akron Brass Company, Wooster, Ohio

Filed May 4, 1970, Ser. No. 34,058
Int. Cl. F16k *51/00*
U.S. Cl. 251—77 12 Claims



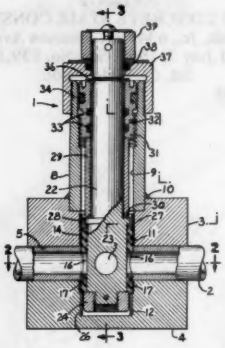
A self-locking valve with means for preventing flow-induced movement of the flow control member, thereby releasably locking the valve at any desired setting. A unitary lock element, in the form of a plate, extends radially between a valve-operating shaft and a concentric arcuate wall of a fixed coaxial sleeve. A drive arm underlies the lock element and is affixed to the shaft for rotation therewith. A valve-adjusting member is mounted for rotation coaxially of the shaft and is provided with dependent leg portions which straddle the lock element and the drive arm to engage them simultaneously and maintain them in alignment or registry during the operative rotation of the valve. When the desired valve setting has been achieved, any flow-induced rotation of the shaft causes misalignment of the locking element with the drive arm and causes camming means on the shaft to displace the lock element into locking engagement with the arcuate wall surface so that the previously adjusted valve setting is not distributed.

3,612,478
VALVE

George A. Blazek, Hinsdale, Ill., assignor to Advance Valve Installations, Inc., Hinsdale, Ill.

Filed May 25, 1970, Ser. No. 39,987
Int. Cl. F16k *3/22*
U.S. Cl. 251—145 7 Claims

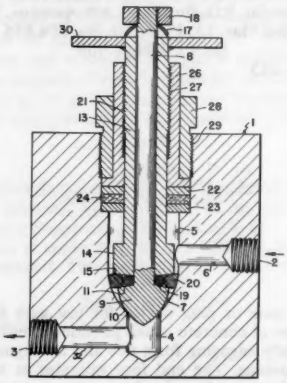
A valve of the type that may be installed in a pipeline without interruption of the service of the pipeline comprises a valve body having a bore that intersects the pipeline, a non-rotatable resilient seal in the bore, and a valve stem rotatable in the seal for opening and closing the valve. Structure is provided for compressing the seal axially so that it expands radially against the perimeter of the pipe openings to form seals thereat. Bearings are carried by the housing for taking the thrust that is exerted against the stem in a direction axially of the pipeline.



3,612,479
DOUBLE SEAT VALVE

Charles W. Smith, Jr., Erie, Pa., assignor to Autoclave Engineers, Inc., Erie, Pa.

Filed July 11, 1969, Ser. No. 840,991
Int. Cl. F16k *1/04, 3/16, 31/50*
U.S. Cl. 251—176 5 Claims

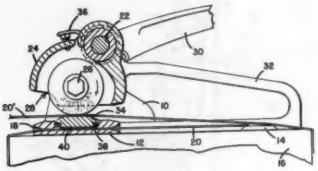


A double seat valve having a hard seat for metering and initial closing and a soft or plastic seat for final sealing. The valve according to this invention has a two part stem. The inner stem terminates in a closure head for cooperating with a hard seat or boot. An outer stem is positioned concentrically and slideably about the inner stem and has a flanged end and face adjacent the back or base of the closure head. An annular plastic sealing means is positioned between the base of the closure head and the flange or face of the outer valve stem. A biasing means urges the two parts of the valve stem against the plastic sealing means. During closing the outer valve stem carries the inner valve stem and closure head against the boot to form the initial seal. Thereafter, the outer valve stem moves relative to the inner valve stem deforming the plastic sealing means out against the walls of the valve body.

ERRATUM

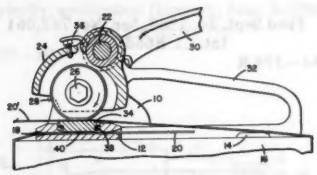
For Class 251—306 see:
Patent No. 3,612,483

3,612,480
FEED WHEEL FOR STRAP TENSIONING TOOL
Warren H. Guy, Glen Mills, Pa., assignor to FMC Corporation, Philadelphia, Pa.
Filed Jan. 21, 1970, Ser. No. 4,674
Int. Cl. B66f *1/00*
U.S. Cl. 254—51 7 Claims



A feed wheel-type package-strap tensioning apparatus particularly adapted for use with nonmetallic strapping involves an improved tensioning wheel having effectively a rough metal surface for engaging the strapping and deforming under pressure so as to provide greater than line-contact with the strapping.

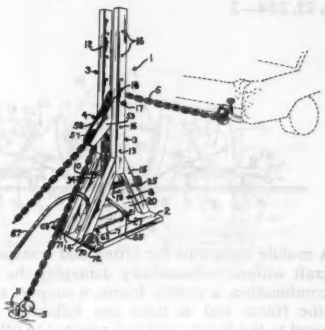
3,612,481
STRAP TENSIONING MECHANISM
Warren H. Guy, Glen Mills, Pa., assignor to FMC Corporation, Philadelphia, Pa.
Filed Dec. 17, 1969, Ser. No. 885,913
Int. Cl. B66f *1/00*
U.S. Cl. 254—51 6 Claims



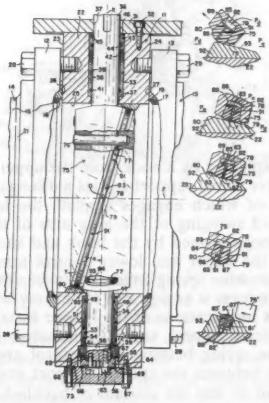
Feed wheeltype strap tensioning mechanism designed for providing a high tension on nonmetallic strapping without damaging the strapping. Instead of the normal line contact between the feed wheel and the strapping, the mechanism is arranged to provide an appreciable area of contact whereby the pulling and gripping force of the wheel is spread over a sufficient area of the strapping as to avoid damaging the same.

3,612,482
PORTABLE APPARATUS FOR APPLYING A PULLING FORCE TO STRUCTURES
Leonard Eck, McPherson, Kans., assignor to Kansas Jack Inc., McPherson, Kans.
Filed Jan. 16, 1970, Ser. No. 3,429
Int. Cl. B66f *3/24*; B21d *41/02*
U.S. Cl. 254—1 11 Claims

A portable apparatus for applying a pulling force to structures includes a base member having a standard mounted thereon and upstanding therefrom with the standard being connected to an anchor spaced from the base member. An extensible member has one end thereof pivotally connected to a fixed point relative to the base member and the other end pivotally connected to a lower portion of a leverage arm having an intermediate portion thereof pivotally mounted on the standard and a guide member is rotatably mounted on an upper portion of the leverage arm. A flexible member has one end secured to a selected portion of the structure to receive the pulling force and the other end fixedly connected relative to the standard with an intermediate portion of the flexible member engaging the guide member whereby extension of the extensible member moves the leverage arm and the guide member mounted thereon to effect a pulling force in the flexible member thereby applying a pulling force to the structure.



3,612,483
VALVES WITH DEFORMABLE SEALING
Eldert B. Pool, Pittsburgh, Pa., assignor to Rockwell Manufacturing Company, Pittsburgh, Pa.
Filed Apr. 12, 1968, Ser. No. 720,941
Int. Cl. F16k *1/22*, *3/00*, *5/06*
U.S. Cl. 251—306 24 Claims

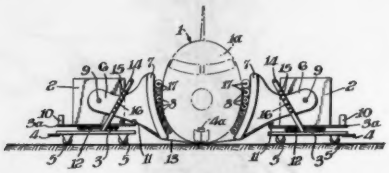


A valve assembly comprises a relatively rigid member defining a fluid flow port and a movable member adapted to engage the port with a fluidtight fit. One of the members is formed with an annular recess in which is mounted a resilient seal ring adapted to engage and be compressed against the rigid member to provide a sealing closure. This seal ring has its opposite sides sealed and maintained immovable as by suitable bonding or clamping to the opposite sides of the recess. A space is provided internally of the seal of such volume that deformation of the compressed seal ring in engagement with the rigid valve member does not fill the space, and that space is vented for pressure equalization.

3,612,484
APPARATUS FOR LIFTING AND TRANSPORTING DISABLED AIRCRAFT

Arthur A. Gallagher, Bryn Mawr, Pa., and Edward A. Gallagher, III, Timonium, Md., assignors to National Steel Erecting Corp., Philadelphia, Pa.

Filed Jan. 6, 1969, Ser. No. 789,187
Int. Cl. B60p 3/12
U.S. Cl. 254—2 5 Claims

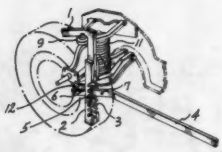


A mobile apparatus for lifting and transporting a disabled aircraft without substantially damaging the aircraft, having, in combination, a mobile frame, a support element attached to the frame and at least one inflatable expandable bag secured to the frame, said bag adapted to lift and support the aircraft when inflated and the process for rapidly lifting and transporting a disabled aircraft without substantially damaging the aircraft using at least one of the apparatus of this invention. The apparatus and method of this invention are useful for lifting and for transporting a grounded disabled aircraft.

3,612,485
AUTOMOTIVE SUSPENSION BALL JOINT CHECKING TONGS

Loyd O. McAfee, 9036 S.W. 37th, Seattle, Wash., and James P. Bohannon, 8820 S. Gayle Ave., Tacoma, Wash.

Filed Oct. 17, 1968, Ser. No. 768,418
Int. Cl. B66f 3/00
U.S. Cl. 254—130 2 Claims



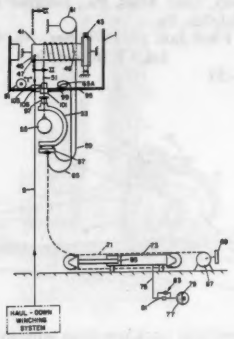
A hanger suspended by a hook from the upper control arm of an automotive wheel support carries a disengageable lever, the short end of which engages beneath the lower control arm. Downward swinging of the long arm of the lever will contract the tongs formed by the hook and short lever arm engaged with the upper and lower control arms and straddling the compression spring engaged between them. The fulcrum pin of the lever is engageable selectively with any set of socket notches in furcations of the hanger for application to differently spaced control arms. Contraction of the tongs compresses the spring between the control arms to relieve the ball joints between the spindle support and the control arms from load so that the amount of backlash between the spindle support and the control arms can be checked.

3,612,486
VERTICAL LOAD TRANSFER

Gerald Joseph Martin, and John Murray Vines, both of Bedford, Nova Scotia, Canada, assignors to Her Majesty the Queen in right of Canada as represented herein by the Minister of National Defence of Her Majesty's Canadian Government

Filed Oct. 17, 1969, Ser. No. 867,277
Int. Cl. B66d 1/50, 1/48
U.S. Cl. 254—172 14 Claims

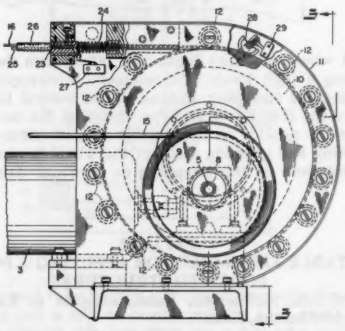
This application discloses a system for lowering a delicate load to the deck of a ship from a helicopter. A first cable maintained at constant tension extends up from the ship, round a pulley or drum carried by the helicopter and down to the said load. This provides support which is substantially constant for the load. A second cable extends down from the load to the ship, and is used to winch the load down to the ship. The system can be used to raise loads from the ship to the helicopter, and can be used for other similar load transfer situations.



3,612,487
DEVICE FOR PUSHING AND PULLING IMPLEMENTS, INCLUDING CABLES, INTO AND FROM CONDUITS AND THE LIKE

William E. Raney, 511 Morewood Parkway, Rocky River, Ohio, and Milan J. Siebert, 5617 Onaway Oval, Parma, Ohio

Filed Sept. 24, 1968, Ser. No. 762,061
Int. Cl. B66d 1/48
U.S. Cl. 254—174 R 4 Claims



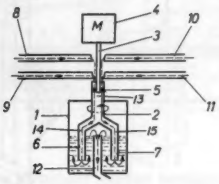
Device for pushing and pulling implements (e.g. pipe coating testers, pipe markers, pipe cleaners, pipe spray guns) along pipes or like elongated workpieces, said device having adjacent spools or reels with spirally coiled implement feeding and operating elements wound on the respective reels, the feeding element being operative to push and pull the implement into and from the pipe (or along the pipe) while the implement operating element is unwound from or rewound onto its reel.

3,612,488

MIXER

Gunter Friedrich Bartel, Lotte Kreis, Tecklenburg, and Martin Klawitter, Rieste, both of Germany, assignors to Die Kunststoffburo Osnabruck Dr. Reuter GmbH & Co. KG, Lotte, Germany

Filed Oct. 31, 1960, Ser. No. 873,003
Claims priority, application Germany, Nov. 2, 1968, P 18 06 639.2
Int. Cl. B01f *15/02, 7/20*
U.S. Cl. 259—8 4 Claims



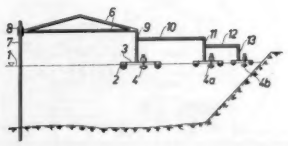
A mixer is provided with a forked tubular stirrer adapted to receive liquids at its upper end and to discharge them into a mixing chamber through tines. An overflow pipe extends through the bottom of the tank and insures an accumulation of liquids in the chamber.

3,612,489

APPARATUS FOR THE SURFACE AERATION OF STILL AND RUNNING WATERS BY MECHANICAL MEANS

Endre Abraham, and Laszlo Tasfi, both of Budapest, Hungary, assignors to Vizgazdalkodasi Tudomanyos Kutato Intezet, Budapest, Hungary

Filed Mar. 3, 1969, Ser. No. 803,694
Claims priority, application Hungary, Mar. 6, 1968, VI 606
Int. Cl. B01f *7/30*
U.S. Cl. 259—102 3 Claims



A mechanical water-aerating device known per se and preferably having a vertical main shaft, is mounted on a float, the latter being connected by means of a rod or cable to a stay fixed in the bed of the water. The rotation of the aerating device causes revolution of the float around the stay so that a large surface of the water is aerated.

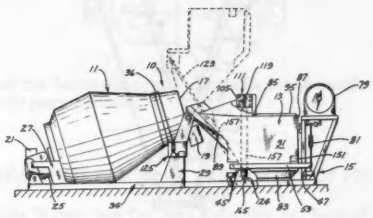
3,612,490

COMBINATION WEIGHING AND MIXING APPARATUS FOR FERTILIZER OR THE LIKE

Cecil W. Bopp; James B. Porter, Jr., and William H. Cone, all of Waterloo, Iowa, assignors to Construction Machinery Company, Waterloo, Iowa

Division of Ser. No. 682,347, Nov. 13, 1967, Pat. No. 3,539,029
Filed June 13, 1969, Ser. No. 833,067
Int. Cl. B28c *7/04*; G01g *19/00*
U.S. Cl. 259—154 9 Claims

A combination weighing and mixing apparatus for fertilizer or the like comprising a skip loader normally freely supported on a weigh scale and which is pivotal about one of its upper ends by a hydraulic cylinder means to facilitate the dumping of the material therefrom into a mixing drum after the material has been weighed. The mixing drum is of the type used in the cement-mixing industry and is designed to mix the material deposited therein while revolving in one direction and to discharge the material therefrom while revolving in the opposite direction. The apparatus also includes means for automatically freeing the skip loader from the cylinder means and the skip loader support means while the skip loader is supported on the weigh scale. The cylinder means includes means thereon to insure that the skip loader will be gently placed on the weigh scale after the material has been dumped therefrom.

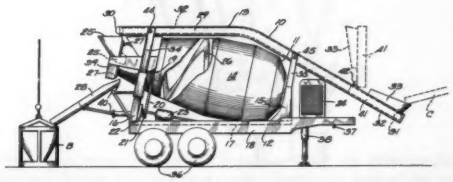


3,612,491

CONCRETE HOLDING MIXER

Robert W. McKillop, Milwaukee, and William Stanis, Muskego, both of Wis., assignors to Rex Chainbelt Inc., Milwaukee, Wis.

Filed May 21, 1970, Ser. No. 39,495
Int. Cl. B28c *7/00*
U.S. Cl. 259—161 6 Claims



A concrete mixer is adapted for use as a temporary concrete holding drum by providing a conveyor for charging the mixer drum with premixed concrete for holding or discharge directly to the mixer discharge chute. The entire unit is transportable and the conveyor is separately demountable therefrom such that the mixer may be operated as a conventional transit mixer.

3,612,492

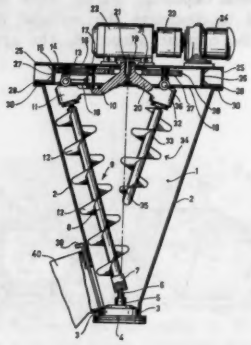
DEVICE FOR MIXING, KNEADING OR DRYING SUBSTANCES

Constant Johan Nauta, Overveen, Netherlands, assignor to Nautamix Patent A.G., Zug, Switzerland

Filed Feb. 18, 1970, Ser. No. 12,317
Claims priority, application Netherlands, Feb. 21, 1969, 69,02737
Int. Cl. B01f *7/00*
U.S. Cl. 259—102 12 Claims

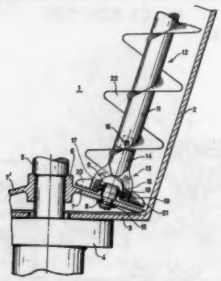
A device for mixing, kneading or drying substances includes one mixing screw which extends substantially along the longitudinal length of the inner surface of a frustoconical vessel in which it is mounted. A second mixing screw which

is supported and driven from its upper end is also mounted in the vessel. The lower end of the second mixing screw is un-



supported and spaced from the bottom of the vessel at a location in or close to the axis of symmetry of the vessel.

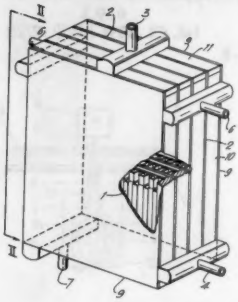
3,612,493
LOWER BEARING ASSEMBLY FOR A MIXING SCREW
Constant Johan Nauta, Overveen, Netherlands, assignor to Nautamix Patent A. G., Zug, Switzerland
Filed July 11, 1969, Ser. No. 840,999
Claims priority, application Netherlands, July 19, 1968, 6810332
Int. Cl. B01f *7/00*
U.S. Cl. 259—102 **7 Claims**



A lower bearing for the shaft of a mixing screw has a fork-shaped lower end portion having two spaced legs between which a guide plate is adapted to be slid laterally into assembled position and thereafter supported by said legs in said assembled position. A vessel in which the mixing screw is mounted has a lower arm mounting a circular pin. The guide plate has an opening in which said pin is received to thereby rotatably support the lower end of the mixing screw in said vessel.

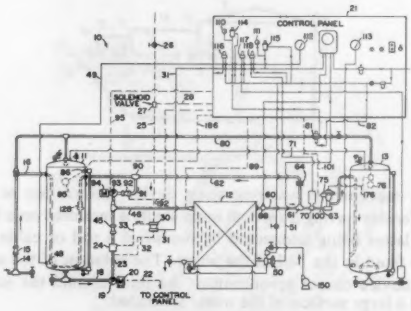
3,612,494
GAS-LIQUID CONTACT APPARATUS
Akira Toyama, Kobe-shi; Yukio Nakako, Nishinomiya-shi, and Toshio Kanazawa, Kobe-shi, all of Japan, assignors to Kobe Steel, Ltd.
Filed Sept. 10, 1969, Ser. No. 856,622
Claims priority, application Japan, Sept. 11, 1968, Sept. 20, 1968, Sept. 22, 1968, 43/65339; 43/6805 43/70051
Int. Cl. B01f *3/04*
U.S. Cl. 261—112 **12 Claims**

In a gas-liquid contact apparatus comprising a gas-liquid contact part accommodating metal fin material, a liquid distributor provided on the gas-liquid contact part, a gas distributor provided at an appropriate position on the gas-liquid contact part, a liquid inlet provided in connection with the liquid distributor, a liquid outlet provided at the lowest position of the apparatus, a gas inlet provided in connection with the gas distributor and a gas outlet provided at the highest



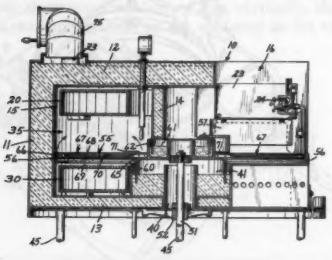
position of the apparatus, an improvement wherein the fin material consists of one or more corrugated metal fins mounting to each other and at least one gas-liquid redistributor for forming a gas passage on the side of a liquid distribution conduit and in which are provided at the bottom at a position lower than the liquid distributor and higher than the gas distributor.

3,612,495
CARBONATOR AND METHOD OF OPERATION THEREOF
Bruce G. Copping, Akron, Ohio, assignor to A-T-O, Inc., Willoughby, Ohio
Filed July 3, 1969, Ser. No. 838,845
Int. Cl. B01f *3/04*
U.S. Cl. 261—140 R **10 Claims**



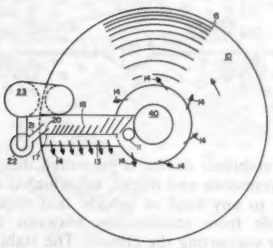
The carbonator system includes first and second beverage vessels with a heat exchanger operatively connected between the vessels with the output of the heat exchanger flowing to the second beverage vessel or receiver. Means provide for pressure flow of beverage to and through the heat exchanger and to the second beverage vessel, carbonation means are present for injection of CO_2 gas under pressure into the beverage prior to its flow to the heat exchanger, and means are present to divert part of the output of beverage from the heat exchanger for return flow to the first beverage vessel. Control means are present to provide the carbonation gas to the system only when beverage is flowing to the second vessel, and in controlled proportion to the rate of flow.

3,612,496
OVEN
Peter N. Latuff, 868 University Ave., St. Paul, Minn.
Filed Oct. 17, 1969, Ser. No. 867,144
Int. Cl. F27b 9/16; A21b 1/10
U.S. Cl. 263—7 9 Claims



An oven having a toroidally shaped heating cavity therein with toroidal fire chambers coaxially mounted within the cavity in axially spaced-apart relationship and a rotatably mounted disk positioned therebetween to receive thereon materials to be heated. The oven has a central opening insulated from the cavity in which the mechanism for mounting the disk is mounted. The upper and lower fire chambers have flames injected therein in opposite directions and a wedge-shaped opening provides access to the disk.

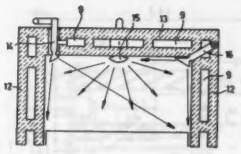
3,612,497
CENTER FEED ROTARY HEARTH CALCINER
Victor D. Allred, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio
Filed Dec. 22, 1969, Ser. No. 887,450
Int. Cl. F27b 9/18
U.S. Cl. 263—22 8 Claims



A rotary hearth calciner having a hearth somewhat like a phonograph turntable rotating within a covered chamber. Granular material to be calcined is fed to the center of the rotating hearth and is gradually moved outward by rabbles so that it discharges near the outer edge of the rotary hearth. Thus, the coke bed is thinnest at the outermost portion of the hearth, permitting highest temperature exposure when the last volatiles are to be driven from the coke.

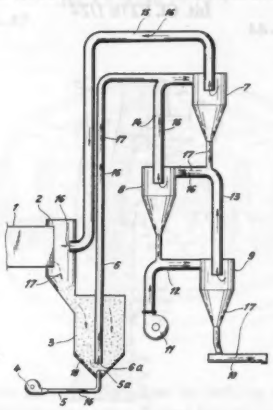
3,612,498
APPARATUS FOR HEATING AND CONTROLLING KILN ATMOSPHERE
Otto Voigt, Am Plannenstiel 14,89, and Alois Steimer, Unterfelstr. 5, 8902 Goggingen b., both of Augsburg, Germany
Filed Oct. 7, 1969, Ser. No. 864,403
Claims priority, application Germany, Oct. 7, 1968, P 18 01 613.2
Int. Cl. F27b 9/00
U.S. Cl. 263—28 11 Claims

In the wall or ceiling of a furnace or kiln for the heat treatment of materials there is disposed at least one burner tube assembly which introduces a mixture of additional air and fluid fuel into the firing zone at supersonic speed; the blow



nozzle of the burner is constructed as a Laval nozzle for supercritical pressure ratio.

3,612,499
APPARATUS FOR HEAT TREATMENT OF FINE MATERIAL
Paul Oelde Weber, and Gerhard Butschko, Jr., both of Enningerloh, Germany, assignors to Polysius AG., Neubecku, Graf-Galen-Strasse, Germany
Filed Dec. 15, 1969, Ser. No. 884,876
Claims priority, application Germany, Feb. 12, 1969, P 19 06 896.3
Int. Cl. F27b 7/38
U.S. Cl. 263—32 4 Claims

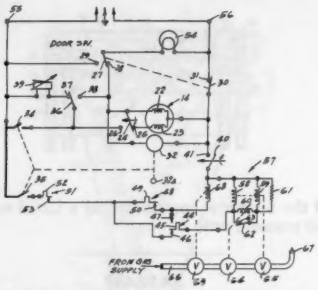


The apparatus comprises a rotary kiln, an intermediate chamber which is connected to the discharge end of the kiln and is arranged to receive fired material therefrom, and which extends a substantial distance below the discharge end of the kiln, so as to hold a column of substantial height of material discharged from the kiln, and apparatus for discharging air under pressure in a zone in the lower portion of a column of material in the chamber. A duct for conveying the material by air entrainment to a cooling zone, has its inlet in the zone in which the air is discharged in the lower portion of the column, and a conduit is provided for conducting to the rotary kiln air discharged from the cooling zone. The column of material in the chamber serves as a seal between the rotary kiln and the zone in which the air is discharged in the lower portion of the column.

3,612,500
DRYER CONTROL CIRCUIT
Norbert P. Cramer, and Jay A. Wiechert, both of Benton Harbor, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 29, 1969, Ser. No. 888,574
Int. Cl. F27b 7/00
U.S. Cl. 263—33 B 4 Claims

A source of heat is operated at a high-output level during an initial portion of a drying cycle and at a lower output level

during a subsequent portion of the drying cycle under the control of a dryer control circuit which includes a plurality of thermostats which control the electrical disposition of corresponding portions of the source of heat in circuit with an electrical supply. The dryer control circuit is applicable to both gas and electric dryers.

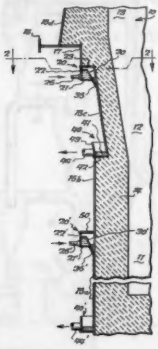


3,612,501

FURNACE-COOLING APPARATUS

Frank A. Berczynski, Williamsville, and Herbert L. Benz, Orchard Park, both of N.Y., assignors to A. E. Anderson Construction Corporation, Buffalo, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,742
Int. Cl. F27b *1/24*
U.S. Cl. 263—44 **9 Claims**



An annular liquid-distributing chamber encircles the exterior shell of a furnace and has an open space in the bottom wall thereof extending the entire length of the chamber. A resilient sealing strip attached to the chamber bottom wall extends across the open space into contact with the exterior shell so as to distribute cooling liquid therealong. One or more conduits deliver cooling liquid to the chamber behind a weir over which liquid flows to the sealing strip. A trough spaced below the chamber receives cooling liquid after it has traveled downwardly along the shell surface.

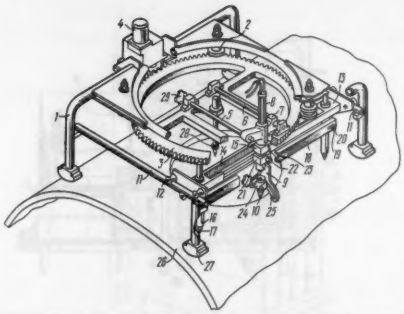
3,612,502

APPARATUS FOR CUTTING HOLES IN STRUCTURES AND DETAILS HAVING CYLINDRICAL SURFACE

Viktor Mikhailovich Vasiliev, ulitsa dzerzhinskogo, 3, kv. 60; Robert Ashotovich Shiganov, ulitsa Shurukhina, 26, kv. 75; Alexander Ilich Remesnikov, prospekt Lenina, 179, kv. 114; Jury Nikolaevich Kosik, ulitsa Gelendzhikskaya, 21, kv. 2; Nikolai Borisovich Skorikov, prospekt Lenina, 179, kv. 140, and Alexandr Arkadievich Krikorian, prospekt Lenina, 21, kv. 92, all of Volgograd, U.S.S.R.

Filed Dec. 23, 1969, Ser. No. 887,648
Int. Cl. B23k *7/04*
U.S. Cl. 266—23 M **2 Claims**

An apparatus for cutting holes in structures and details having cylindrical surface with the aid of a cutter mounted with a possibility of simultaneous displacement in horizontal and vertical planes, in accordance with a mode set by a profiling device whose cams are placed on both sides of the cutter and are connected with the latter by means of a rod pivotally connected to the cutter and the cams, which rod, capable of tilting in a vertical plane, serves to maintain the cutter position at the level of a preset distance between the cutter and the surface of a structure in which a hole is being cut.

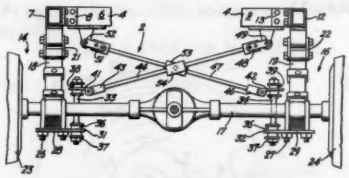


3,612,503

VEHICLE STABILIZER DEVICE

Gene S. Tanno, 3451 Rosedale Drive, San Jose, Calif.

Filed Sept. 26, 1968, Ser. No. 762,903
Int. Cl. B60g *21/04*
U.S. Cl. 267—11 **5 Claims**



A vehicle stabilizer device is presented that is particularly useful for automobile and trucks, but which is applicable in a broad sense to any kind of vehicle that requires or which would benefit from stabilization between a chassis and running gear supporting the chassis. The stabilizer device of the invention provides a pair of beams, each of which is connected to an associated one of the frame members of the chassis, with the opposite end of that beam being connected to the running gear associated with the opposite frame member of the chassis. Intermediate their ends the beams are juxtaposed and interconnected by a pivotal and slidable union which permits a scissoring action between the beams when forces are imposed thereon. Such scissoring action cooperates with the inherent resilience of the beams to stabilize relative movement between the chassis and the running gear of the vehicle.

3,612,504

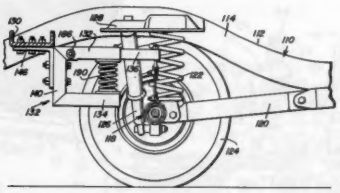
ROLL AND SWAY CONTROL SYSTEM

Julian C. Garate, Reno, Nev., assignor to Charles V. Prather; Birgit K. Preston and C. A. Luckey, Reno, Nev., part interest to each

Filed Nov. 10, 1969, Ser. No. 875,388
Int. Cl. B60g *11/16*
U.S. Cl. 267—20 **14 Claims**

A spring-controlled structure operatively connected between a corresponding vertically shiftable wheel of a vehicle and frame and body of an associated vehicle and func-

tioning to increasingly yieldingly resist upward motion of body and frame of the associated vehicle from a predetermined position when the vehicle is in a stationary position. The structure increasingly yieldingly resists the distance of separation between the vertically shiftable wheel and a predetermined position of vertical travel of the vertically shiftable body in an up movement past the predetermined stationary rebound point. However, the structure does effectively slow the downward motion of the vertically shiftable wheel and increasingly speeds up the rebound to the original



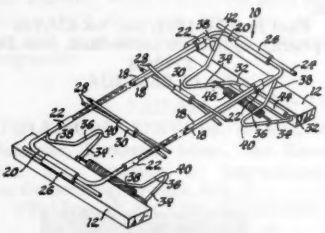
static or predetermined position between the vertically shiftable frame and vertically shiftable wheel. The structure does not aid in laden weight carrying capacity of the associated vehicle, but does effectively control laden weight and high center of gravity laden weight by increasingly yieldingly resisting the frame and body of associated vehicle in any upward and side-to-side motion of high loads. Also, the structure does effectively control the upward movement of an associated vehicle without weight other than that of the associated vehicle.

3,612,505

SPRING ASSEMBLY

John J. Bond, Wickenburg, Ariz., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Oct. 22, 1969, Ser. No. 868,301
Int. Cl. F16f *3/00;* **A47c** *23/02*
U.S. Cl. 267—107 **12 Claims**



A box spring assembly including a frame having a pair of opposite and generally parallel extremities interconnected by ends with a plurality of spring members extending between the extremities, Each spring member is defined by an integral wire having parallel and spaced fishmouth sections interconnected by a generally U-shaped support section. The fishmouth sections are interconnected at the lower ends thereof to the extremities of the frame with the U-shaped sections of pairs of spring members being disposed in overlapping relationship with the base portions of the U-shaped sections being connected to a border wire.

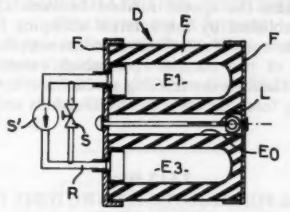
3,612,506

CUSHIONING DEVICE

Andre Alfred Malherbe, 81, rue Pasteur 59, Waziers, France

Filed Sept. 25, 1969, Ser. No. 861,007
Claims priority, application France, Sept. 25, 1968, 167,590
Int. Cl. B60s *11/22*
U.S. Cl. 267—152 **10 Claims**

A block of elastomeric material provided with at least two sealed internal cavities interconnected by a duct means is operatively interposed between two relatively movable bodies, so that distortion of said block causes same to be locally compressed around one of said cavities and locally



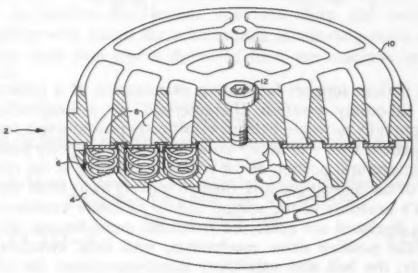
stretched around the other cavity whereby a liquid filling said cavities and said duct means is forced to flow through the latter which is provided with throttling means operative for impeding the flow of said liquid.

3,612,507

VALVE ASSEMBLING APPARATUS

Edward E. Stokes, Borger, Tex., assignor to Phillips Petroleum Company

Filed Dec. 18, 1969, Ser. No. 886,089
Int. Cl. B25b *27/14*
U.S. Cl. 269—47 **3 Claims**



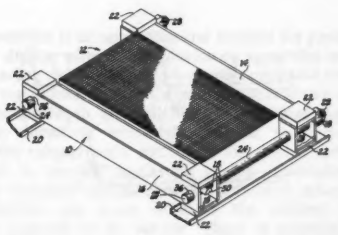
An apparatus having protrusions for holding a plurality of rings of a multiring-type valve against lateral movement during assembly of said valve.

3,612,508

HEATER CORE FIXTURE FOR FACE SOLDERING

William E. Rise, Portage, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 8, 1970, Ser. No. 26,564
Int. Cl. B25b *5/02*
U.S. Cl. 269—90 **3 Claims**



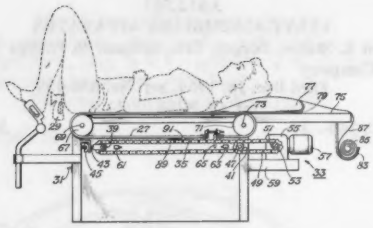
In preferred form a fixture for clamping a rectangular heater core between first and second parallel framing mem-

bers for a subsequent face-soldering operation. The fixture is readily adapted to automatic loading of the heater cores accomplished first by the application of an external clamping force normally against the parallel framing members and next by the application of a locking force axially on a cross rod which maintains the spatial relation between the framing members established by the external clamping force. Cam surfaces on the ends of the cross rod coact with cam surfaces on the ends of two parallel rods which extend normally between and through the framing members to create a frictional holding force between the parallel rods and the framing member.

3,612,509
APPARATUS FOR ADJUSTING LITHOTOMY POSITION OF A PATIENT

Don W. Boston, 3700 Oak Haven, Fort Worth, Tex.; Charles R. Boston, 3801 Carman Drive, Fort Worth, Tex., and Paul D. Suhovy, 3255 Mary's Lane, Fort Worth, Tex.

Filed Feb. 26, 1970, Ser. No. 14,519
Int. Cl. A61g *13/00*
U.S. Cl. 269—328 13 Claims

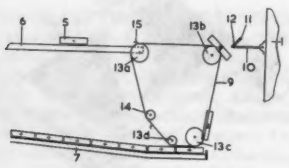


A patient support facilitating examination of a patient in the lithotomy position characterized by a longitudinally reciprocally movable belt for effortlessly positioning a reclining patient with feet in the usual stirrups to properly position the intercrural portion of the patient's anatomy at the stirrup end of the patient support; the belt moving away from the patient's anatomy at the stirrup end to facilitate examination. Also disclosed are preferred structural embodiments including the positive drive mechanism, with limit switches for safety; the belt and upholstery interconnections; the pillow support and paper fastener arrangement; and the optimum thickness of a top structure for use as a replacement top for conventional examining tables.

3,612,510
BAG-HANDLING APPARATUS

Robert Walker Dickson, Ormesby, England, assignor to British Visqueen Limited, London, England

Filed Apr. 20, 1970, Ser. No. 30,163
Claims priority, application Great Britain, May 12, 1969, 24087/69
Int. Cl. B65h *39/02*
U.S. Cl. 270—58 4 Claims

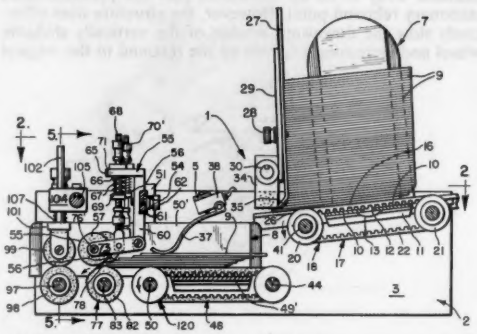


Bag-handling apparatus by which bags received from a bag-making machine are stacked over bars, and means are provided for storing a number of stacked bars before unloading.

3,612,511
FEEDING MECHANISM

Edward S. Godlewski, 531 Walnut St., Des Plaines, Ill.

Filed June 5, 1969, Ser. No. 830,787
Int. Cl. B65h *1/06, 3/06*
U.S. Cl. 271—35 9 Claims

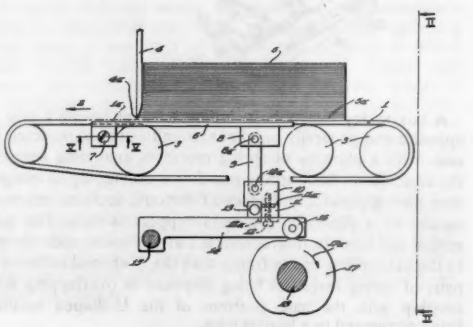


A mechanism for feeding stock in batches from the bottom of a pile of stock located in a primary magazine to a secondary magazine and arranging the items shingle fashion thereupon, a timed conveyor discharging the stock one at a time from the bottom of the secondary conveyor in conjunction with a pair of serially arranged spaced parallel metering rollers which are timed to move incrementally with the conveyor to advance the bottom stock item to a pullout roller assembly, the stock items being metered by a series of retards offset along the path of travel of the item and the downstream retard forming with the second metering roller on intake nip for the bottom item being fed thereinto.

3,612,512
SHEET MATERIAL FEED CONTROL APPARATUS

Pierre Lang, Ecublens, Switzerland, assignor to J. Bobst & Sons, Inc.

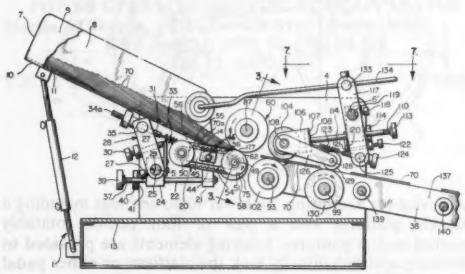
Filed June 24, 1969, Ser. No. 835,936
Claims priority, application Switzerland, June 24, 1968, 9770/68
Int. Cl. B65h *3/34*
U.S. Cl. 271—35 8 Claims



Feeding sheet material on a conveyor means continuously moving in a first direction past a gauge means is efficiently accomplished by means of a feed control means comprising elongated lifting members positioned adjacent and in some cases between the conveyor means behind the gauge means whereby when the lifting member upper surface is below the upper surface of the conveyor means the sheet material may be fed past the gauge means and when the upper surface of the lifting member is above the upper surface of the con-

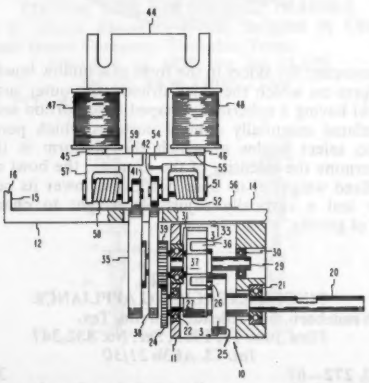
veyor means the sheet material is out of engagement with the conveyor means and feeding is halted. Synchronized movement of the lifting members is provided by a lifting assembly which includes a pair of rotating cams, a pair of follower means riding on said cam, a rod connecting the follower means with the lifting member and a transverse beam connecting the follower means whereby movement of the cam is transmitted through the follower arms and the connecting rods to the lifting members to cause them to move together into and out of engagement with the sheet material, thereby controlling the feeding of the sheet material past the gauge means.

3,612,513
FEEDING MECHANISM
Edward S. Godlewski, 531 Walnut St., Des Plaines, Ill.
Filed Sept. 30, 1968, Ser. No. 763,820
Int. Cl. B65h *1/08*
U.S. Cl. 271—37 **14 Claims**



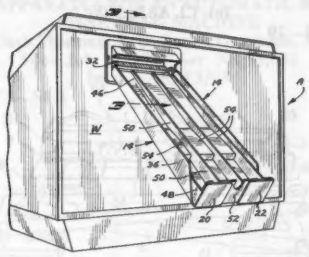
A feeder mechanism for feeding stock items such as sheets of paper, cards, manifolds, stuffed envelopes, etc. and comprising a magazine, a metering roller assembly, and a transition fanning device extending from the magazine to the metering roller assembly which delivers the stock items into an aligner from which the items issue into an associated mechanism such as an imprinter, slitter, perforator, etc. in desired progression.

3,612,514
MULTIPLE MODE GENEVA DRIVE MECHANISM
Jess J. Schweihs, Rochester, Minn., and Klaus Hausler, Columbia, Mo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 30, 1969, Ser. No. 837,829
Int. Cl. B65h *5/06*
U.S. Cl. 271—51 **8 Claims**



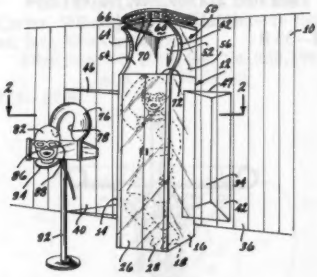
A geneva drive mechanism having output feed wheels which rotate about a common axis, for driving a document selectively in either an incrementing mode or a continuous transport mode.

3,612,515
DEVICE FOR COLLECTING, IDENTIFYING AND STACKING FILM PIECES
Emory K. Bergeson, St. Louis Park, Minn., assignor to Pako Corporation, Minneapolis, Minn.
Filed Sept. 3, 1969, Ser. No. 855,161
Int. Cl. B65h *31/22, 31/24*
U.S. Cl. 271—86 **4 Claims**



The disclosure includes a device for collecting, identifying and stacking film pieces delivered from a film processing machine having a chute for receiving film pieces and formed with stop means at the lower end thereof, means for supporting the chute on the machine at an oblique angle to the vertical to receive film pieces delivered from the machine together with means for substantially eliminating static electricity from film pieces delivered from the machine on the chute.

3,612,516
APPARATUS AND METHOD FOR PRODUCING DISPLAY ILLUSIONS
James Mark Wilson, 4914 Regal Oak Drive, Encino, Calif.
Filed Jan. 13, 1969, Ser. No. 790,606
Int. Cl. A63j *5/00*
U.S. Cl. 272—9 **8 Claims**



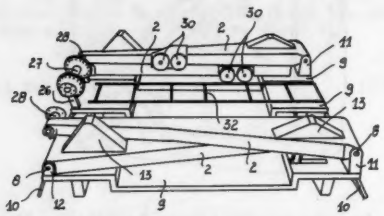
The invention is an apparatus and method for producing illusionary display effects. The device or apparatus includes a cabinet having doors and provided with concealed means and a passageway with trap doors whereby a person can enter the cabinet unknown to an audience. The passageway is concealed by members mirrored on both sides positioned between the cabinet and a backdrop. The mirror surfaces are positioned to provide for equal angles of incidence and reflection between the mirrors and adjacent reflected surfaces whereby the space between the cabinet and the backdrop appears to be vacant. There is provided also a robot head for which the head of a person is substituted. A girl assistant enters the cabinet through the concealed passageway and stands in a concealed position. The magician places the robot head in position where it is grasped and held

by the girl. A globe with a cutout is placed over the head and manipulated to momentarily conceal it, at which point the girl removes it, and substitutes her own, after which she steps forth, the disembodied head apparently having become embodied.

3,612,517
FERRIS WHEEL

Anton Schwarzkopf, Munsterhausen, Schwaben, Germany, assignor to A. Schwarzkopf Stahl -u. Fahrzeugbau, Munsterhausen, Schwaben, Germany

Filed Nov. 14, 1968, Ser. No. 775,791
Claims priority, application Germany, Nov. 14, 1967, P 16 03 179.1
Int. Cl. A63g *1/00*
U.S. Cl. 272—29 **9 Claims**

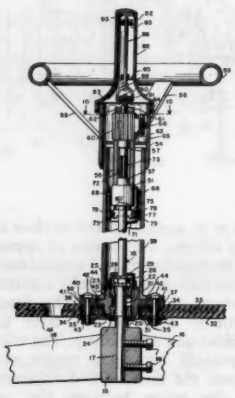


A collapsible Ferris Wheel has a shaft with a central hub section and two outer sections detachably interconnected, the outer shaft sections being journaled in legs swingably supported on respective carriages while a further carriage, sandwiched between the other two, has a cradle to receive the hub section upon disassembly of the structure. The legs, which come to rest on their carriages in the collapsed position, may have telescoped extensions carrying the journal bearings for the shift and are also provided with hoods projecting upwardly in that position while being downwardly open to receive the upper ends of elevating jacks rising from these carriages.

3,612,518
OCCUPANT PROPELLED MERRY-GO-ROUND

David F. Bennett, 1100 Fleetwood Ave., Daytona Beach, Fla.

Filed Dec. 2, 1969, Ser. No. 881,544
Int. Cl. A63g *1/12*
U.S. Cl. 272—33 R **7 Claims**

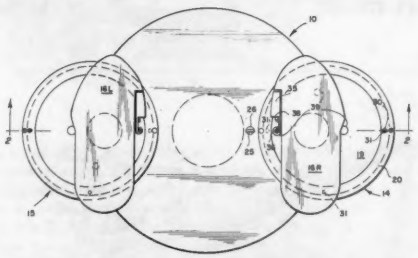


An occupant propelled merry-go-round having a tub-shaped passenger compartment providing an annular seat and an annular backrest surrounding the seat. The passenger compartment is rotatably supported by a stationary supporting structure which additionally supports a handwheel centrally of the passenger compartment. The handwheel is rotatable in one direction only relative to the supporting structure so that when torque is applied thereto in the opposite direction by one or more of the occupants, the compartment is caused to rotate in the first mentioned direction. A brake including a lever conveniently disposed and mounted for universal rocking movement for manual actuation by any of the passengers is provided to effect stopping of rotation of the passenger compartment.

3,612,519
EXERCISING DEVICE WITH LOCKABLE ROTATING FOOT PEDALS

William F. Larson, Carson, Wash. 98610

Filed July 9, 1968, Ser. No. 743,394
Int. Cl. A63b *23/04*
U.S. Cl. 272—57 A **12 Claims**

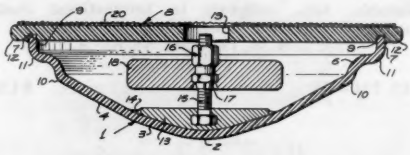


A device for exercising the lower torso and legs including a rotatable platform and a pair of foot pedals rotatably mounted on the platform. Locking elements are provided to selectively and individually lock the platform or either pedal against rotation. Each pedal is mounted off center on a rotatable adjusting disc for varying the distance between the pedals.

3,612,520
ROCKABLE EXERCISING PLATFORM FOR SKIERS

Quong Y. Chang, Los Angeles, Calif., and John W. Stone, Beckley, W. Va., assignors to Life Systems Engineering, Los Angeles, Calif.

Filed Aug. 5, 1969, Ser. No. 847,625
Int. Cl. A63b *23/04*
U.S. Cl. 272—57 B **5 Claims**



An exerciser for skiers in the form of a hollow bowl having a platform on which the skier strands; the outer surface of the bowl having a spherically shaped base portion and angularly related essentially conical portions which permit the skier to select angles at which the platform is tilted to predetermine the intensity of the exercise; the bowl containing a fixed weight at its base portion to lower its center of gravity and a vertically adjustable weight to change the center of gravity.

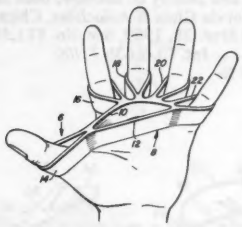
3,612,521
FINGER EXERCISING APPLIANCE

J. D. Wendeborn, 640 Allende, Laredo, Tex.

Filed June 11, 1969, Ser. No. 832,347
Int. Cl. A63b *21/30*
U.S. Cl. 272—67 **3 Claims**

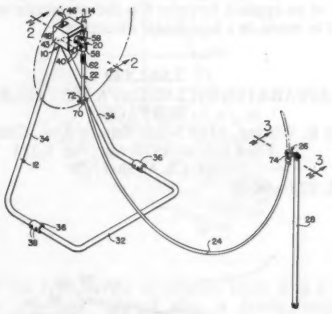
A physical therapy appliance designed and structurally adapted to be removably harnessed on a wearer's hand in a

manner to enable the thumb and fingers to perform movements of extension and abduction simultaneously. It comprises a plurality of individual loops which are comformable



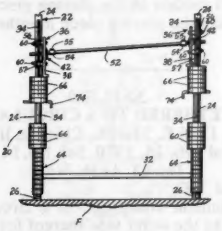
with and adapted to comfortably but retentively encircle base portions only of the thumb and fingers of the selected hand. It also embodies connecting means integrally joined with and operatively linking like end portions of the loops together.

3,612,522
POWER OPERATED SKIPPING ROPE APPARATUS
Martin A. Ekonen, 29581 Puritan Ave., Livonia, Mich.
Filed June 22, 1970, Ser. No. 48,169
Int. Cl. A63b *5/20*
U.S. Cl. 272—75 **8 Claims**



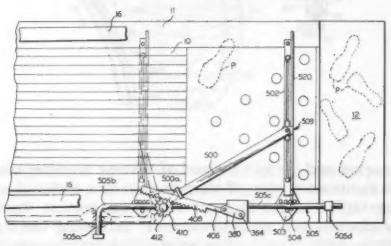
The invention provides a power operated skipping rope secured at one end to a flexible, elastic, metallic arm of music wire attached to a tightly wound coil spring mounted upon a pin member. An elbow fitting provides a slip coupling secured to a motor-driven output shaft and to the pin member allowing slip to occur at the shaft or at the pin member. The other end of the skipping rope is secured to a swivel-type fitting mounted upon a supporting member.

3,612,523
TILTING LIFT BAR WEIGHT TRAINER
Robert P. Glynn, Memphis, Tenn., assignor to Challenger Athletic Goods Company, Memphis, Tenn.
Filed Feb. 16, 1970, Ser. No. 11,675
Int. Cl. A63b *23/00, 23/04*
U.S. Cl. 272—81 **7 Claims**



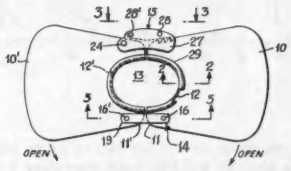
An improved weight lifting apparatus used primarily in gymnasiums and the like for training athletes. It includes a rigid framework structure that supports two opposed pairs of guide rods. A tiltable lifting bar and weight supporting assembly is slidably mounted on each pair of the guide rods, the lifting bar serving to join the two assemblies so that they reciprocate in unison when the apparatus is in use. The principal feature of the invention resides in universal joint means connecting the lift bar to a slide plate, such that one end of the lifting bar may be elevated with respect to the other. Another principal feature resides in guide wheels located on the slide plate which mate with the opposite sides of the guide rod through a concave configuration of the periphery of the guide wheels.

3,612,524
SWEEP APPARATUS FOR AN AUTOMATIC BOWLING PINSETTING MACHINE
Kenneth Clark Sherman, P. O. Box 6, Gambrills, Md.
Filed July 17, 1970, Ser. No. 55,684
Int. Cl. A63d *5/08*
U.S. Cl. 273—54 A **7 Claims**



A sweep apparatus for an automatic bowling pinsetting machine has a sweep mounted on a guide for guiding the movement of the sweep in a generally pivoting movement in which the sweep is positioned across the alley, and then in a rectilinear motion along the alley. A sweep drive arm is mounted on a vertical sweep drive shaft which is rotatable back and forth, and the free end of the sweep drive arm is articulated to the sweep for driving it in said pivoting movement and rectilinearly along the guide.

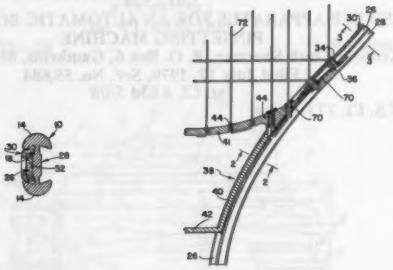
3,612,525
BALL BOUNCE GAME DEVICE
John E. Carter, Wilmington, Del., assignor to None Such Enterprises, Inc., New Castle, Del.
Filed Sept. 16, 1969, Ser. No. 858,396
Int. Cl. A63b *59/00*
U.S. Cl. 273—67 R **9 Claims**



A ball bounce game device comprising a pair of winglike members disposed end to end and having an aperture for mounting the wings on the body of an individual is provided whereby an individual wearing the wings secured about his waist can use a resilient ball, such as a ping-pong ball, tennis ball, rubber ball and the like to bounce the ball from one wing member over his head to the other wing member and back again. The wings are joined together with a pivot means and are detachably secured together by a latch means, with at least one of said pivot means and latch means preferably including means for adjusting the spacing of said wings and the resulting size of the body engaging aperture. A resilient cushion is also preferably provided around the periphery of

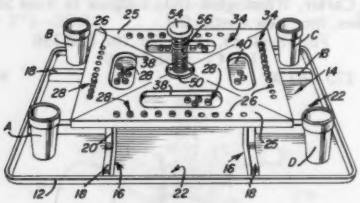
said aperture for the comfort of the player wearing the device.

3,612,526
RACKET WITH METAL I-BEAM FRAME
Joseph M. Brull, 451 Lenox Ave., Oak Park, Ill.
Filed Sept. 19, 1969, Ser. No. 859,364
Int. Cl. A63b *49/08, 49/12*
U.S. Cl. 273—73 C **11 Claims**



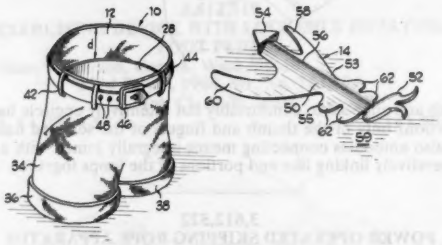
A racket and the like formed of a frame member made of a single continuous strip of aluminum or like material having a substantially I-shape in transverse cross section forming an outer channel and an inner channel extending the length of the strip, with certain other reinforcing metal parts secured to the frame by cement to eliminate riveting and welding.

3,612,527
GAME BOARD HAVING COMPARTMENTS WITH TRAP DOORS
John R. Rogerson, Box 10, Leonardville, New Brunswick, Canada
Filed Jan. 12, 1970, Ser. No. 2,065
Int. Cl. A63f *9/14*
U.S. Cl. 273—86 R **8 Claims**



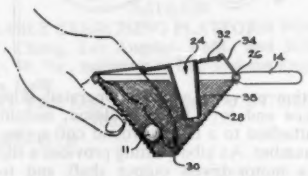
A table-type game device for two or more players characterized by a shallow panlike base providing a receiver and provided in its corners with paired right angularly disposed vertical blocks. These blocks support and elevate a horizontal game board. They also define individual checker trapping bins. The areas of the game board directly above and aligned with the bins are delineated and colored to provide distinguishable zones for the players. Each zone has an ovate slot and an underlying trap door conjointly defining a traylike well in which the distinctively colored and numbered checkers are deposited, according to the rules of the game. When a player succeeds in accumulating his ten checkers in his well, he pushes a spring returned plunger which is linked to the trap doors. All four of the doors then open and chute all collected checkers into the receiver and the lucky player is the winner of the then finished game.

3,612,528
DEFORMABLE PROJECTILE AND TARGET HAVING A VARIABLE OPENING
Marvin I. Glass, and Jeffrey D. Breslow, both of Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Mar. 28, 1969, Ser. No. 811,509
Int. Cl. A63b *71/00*
U.S. Cl. 273—95 R **3 Claims**



Game apparatus for playing a target game including a target member having a variably sized target opening and projectiles of unitary construction having deformable leg members which quickly resume their original positions upon release of an applied force to flip the projectile vertically and cause it to move in a horizontal direction.

3,612,529
PLAY APPARATUS INCLUDING A MOVABLE STRIKING SURFACE
William E. Witting, 4218 North Damen Ave., Chicago, Ill.
Filed Feb. 6, 1970, Ser. No. 9,212
Int. Cl. A63b *67/00*
U.S. Cl. 273—96 R **10 Claims**

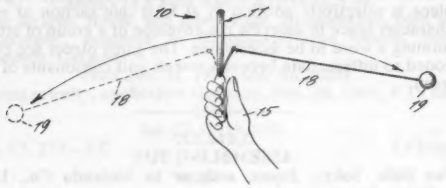


Handheld play apparatus for use with a playing piece such as a ball. A receptacle with an opening for entry of the piece is fixedly attached to a handheld framework. A striking surface for striking the piece is movably suspended from the framework partially covering the opening of the fixed receptacle to provide a variable target area and a variable position of the striking surface. The striking surface has a central aperture opening into a second receptacle to provide a second movable target area. The playing piece may be placed in a recess on the striking surface. The framework is set in motion to impart motion to the playing piece. Points may be scored by catching the playing piece in either of the receptacles.

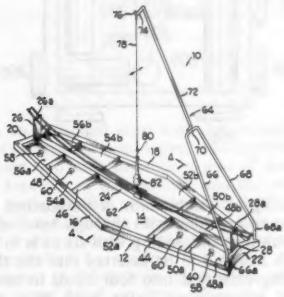
3,612,530
BALL TETHERED TO A CIRCULAR HOOP
Henry S. Smith, 1226 E. 71st Pl., Chicago, Ill.
Filed Feb. 26, 1970, Ser. No. 14,433
Int. Cl. A63b *71/04*
U.S. Cl. 273—98 **8 Claims**

A game implement comprised of a circular hoop with a handle secured to the outer side thereof for being grasped in a person's hand, the hoop having a radially inwardly extending projection of flexible nature and to which there is secured one end of a tethering line, the opposite end of the tethering

line being secured to a small ball, and which in operative use is attempted to be driven through the hoop from both opposite directions so to develop a score when the device is used competitively.



3,612,531
GRAVITY PROJECTED BALL GAME INCLUDING DISLODGING MEMBER
Gordon A. Barlow, Evanston, Ill., assignor to Marvin Glass & Associates
Filed Nov. 3, 1969, Ser. No. 873,449
Int. Cl. A63d *13/00*
U.S. Cl. 273—101 **10 Claims**

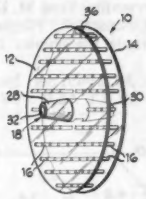


A game of the type having an arcuate track with a rolling member for traversal thereof and a freely suspended weighted member, characterized by the provision of a base on which the arcuate track is located, the base being divided into scoring zones of reduced dimension near the upturned ends of the arcuate track and enlarged dimension near the medial portion thereof, with the object of the game being to attempt to remove the traversing rolling member from the track by means of the freely suspended weighted member.

3,612,532
APPARATUS HAVING A COVER CONTINUALLY DECREASING THE DEGREE OF ACCESSABILITY OF A TARGET
Ned Strongin, 936 Willow Bend, Baldwin, N.Y.
Filed Apr. 13, 1970, Ser. No. 027,677
Int. Cl. A63b *63/00*
U.S. Cl. 273—102 R **3 Claims**

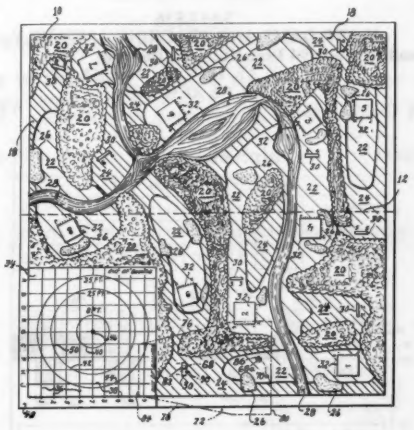
A game device for two or more players embodying a bowl and a gravity-induced cover therefor, the cover being mounted on a specially formed spiral shaft, enabling the player to quickly push the cover upwardly to open position relatively to the bowl, causing a vibratory sound by slip passage of flexible pawl means on the cover. Then the player endeavors to throw into the bowl as many indicators, such as those of a group of colored balls assigned to him for the play, before the rapidly spinning downward moving cover closes the bowl.

3,612,533
MANUAL MANIPULATION TOY
Jeffrey D. Breslow, Evanston, Ill., assignor to Marvin Glass & Associates
Filed June 25, 1969, Ser. No. 836,478
Int. Cl. A63f *7/04*
U.S. Cl. 273—113 **4 Claims**



A manipulation toy having a pair of generally parallel spaced-apart plates spanned by pinlike ribs with a ball-holding pocket on the periphery thereof between the spaced plates. The center of the plates has aligned openings therethrough spanned by a generally circular enclosure having a ball-receiving slot. Sleevelike members project laterally outwardly from opposite sides of the center of the plates in communication and alignment with the openings therein and with the enclosure.

3,612,534
SIMULATED GOLF GAME
Edmond G. Browne, Medford, Mass., assignor to Walter J. Kreske, Newton Centre, Mass., a part interest
Filed May 2, 1968, Ser. No. 726,074
Int. Cl. A63f *3/02*
U.S. Cl. 273—134 CG **10 Claims**



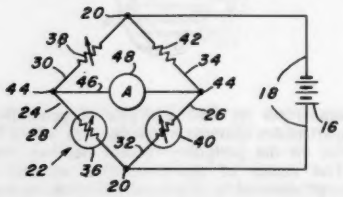
A golf game comprised of a plane surface carrying a pictorial scaled configuration of a multihole golf course having fairways, greens having coded areas, and playing hazards on which is a moveable golf ball locating template having an index reference alignable with a simulated golf ball wherever it may lie on the golf course and having a plurality of coded

golf ball possible destinations in spaced relation to the index reference with the particular destination being determined by a spinner associated with golf club cards wherein each card represents a different golf club and carries such portion of the destination identifying code markings with respect to the spinner as are realistic probabilities of golf ball destinations for the particular golf club represented by the selected card. Also included is a golf green to enlarged scale having intersecting lines and associated coded templates for identifying the lines so as to provide an intersecting line position for each of the golf course green coded areas for ready transfer of a golf ball from any of the golf course greens to an intersecting line position on the enlarged scale green for putting out each hole in cooperation with said spinner.

3,612,535
BODY HEAT COMPARISON GAME

Robert E. Davis, Murrysville; Fred M. Heddinger, Pittsburgh, and Wallace H. Kirkpatrick, Pittsburgh, all of Pa., assignors to Pennsylvania Electronics Technology, Inc., Pittsburgh, Pa.

Filed Jan. 30, 1969, Ser. No. 795,157
Int. Cl. A63f *3/00*
U.S. Cl. 273—135 R **25 Claims**

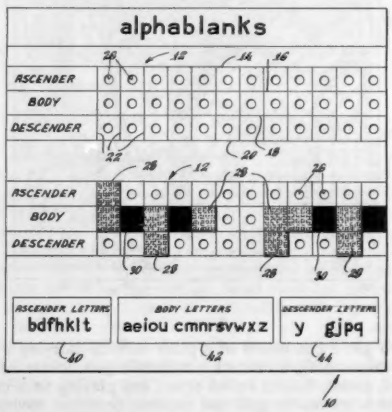


Novel game devices in which players bring a finger or other body part into contact with a thermistor-containing element, and by operation of electrical circuitry, values are observed on an ammeter. The thermistor containing element is preferably "thermally decoupled" from the chassis in which it is located. One disclosed feature involves the use of an audiofrequency oscillator and a speaker, with the thermistor being placed in the tank circuit of the oscillator, to afford an audible indication. A plurality of differently wired plugs or a keyboard, are disclosed for electrically interconnecting the thermistor members at the different stations to provide a multiperson game apparatus.

3,612,536
WORD GAME AND TEACHING ASSEMBLY

Rosalie R. Saul, 94 Deer Hill Ave., Danbury, Conn.

Filed Sept. 17, 1969, Ser. No. 858,735
Int. Cl. A63f *9/06*
U.S. Cl. 273—153 R **7 Claims**

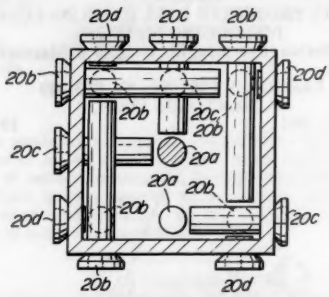


An educational game apparatus which comprises a game board having one or more word rows with each word row divided up into a succession of alphabet character spaces. Each character space is divided into an upper ascender section, a middle body section, and a lower descender section. A game piece is selectively position in at least one section of each character space to describe the envelope of a group of letters forming a word to be ascertained. The game pieces are color coded to differentiate between vowels and consonants of the word.

3,612,537
ASSEMBLING TOY

Jun Sato, Tokyo, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan

Filed Aug. 1, 1969, Ser. No. 846,812
Claims priority, application Japan, Jan. 20, 1969, 44/4310
Int. Cl. A63f *9/08, 9/04*
U.S. Cl. 273—156 **1 Claim**

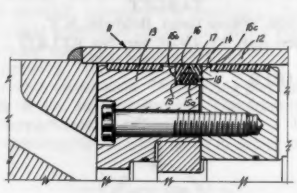


A toy having in combination a hexahedral hollow body whose walls are provided with through-holes of the number beginning with one and ending with six as is in the case of a die, and rods adapted to be inserted into the through-holes, the rods being classified into four kinds in respect of their lengths, the arrangement being such that the rods are adapted to be all received in the through-holes in the walls of the body only when each of the through-holes is associated with a rod of suited length and otherwise an interference will occur between rods inserted through through-holes.

3,612,538
PISTON RING SYSTEM

Ward Sievenpiper, Milgrove, N.Y., assignor to A-T-O Inc., Cleveland, Ohio

Continuation-in-part of application Ser. No. 832,132, June 11, 1969, now abandoned. This application June 8, 1970, Ser. No. 44,171
Int. Cl. F16j *9/08, 15/32*
U.S. Cl. 277—165 **13 Claims**

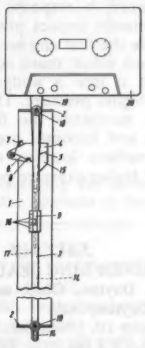


A multiple element seal ring system for pistons and the like including first and second split rings of pressure nondeformable material, preferably glass-filled nylon, adapted to be juxtaposed in a groove. A ring of resiliently yieldable, pressure deformable material, for example neoprene, has an interference fit between the groove bottom wall and a space defined by corresponding annular recesses along the inner surfaces of the nylon rings. Connecting lugs on the deformable ring received in grooves in the nylon rings prevent relative rotation of the system rings and maintain the ring partings out of alignment.

3,612,539
RECORDING TAPE GUIDE APPARATUS, PARTICULARLY ADAPTED FOR USE WITH TAPE CASSETTES FOR EDUCATIONAL USE

Peter Bragas, Itzum, and Horst Rubi, Himmelsthur, both of Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Germany

Filed Jan. 21, 1970, Ser. No. 4,609
Claims priority, application Germany, Feb. 20, 1969, P 19 08 481.2
Int. Cl. G11b *5/00*
U.S. Cl. 274—4 C 1 Claim

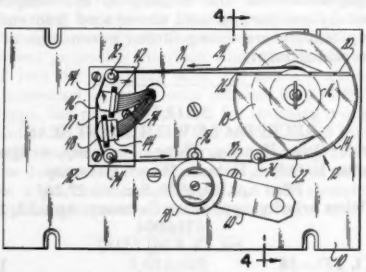


To provide an extended tape loop for recording of student's answers on instructional tapes, a swingable guide element is provided, movable between a pair of positions, one extending the tape out of the cassette, and the other causing the swingable guide element to swing beneath the tape in the cassette and pull out the tape towards the first position; the guide element is mounted on a guide track, swinging movement being controlled by a cam. The entire apparatus is placed with respect to the tape in the position otherwise occupied by the erase head, so that, when the tape loop is pulled out, the extending loop can be brought in operative association with recording and erase heads for educational use.

3,612,540
TAPE DECK USING ENDLESS TAPE CARTRIDGE

Justin L. Turner, Branford, Conn., assignor to Message Systems, Inc., New Haven, Conn.

Filed Nov. 13, 1968, Ser. No. 775,481
Int. Cl. G11b *23/06;* B65h *27/00*
U.S. Cl. 274—4 B 12 Claims

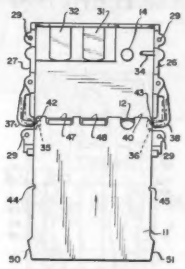


A tape deck for use with an endless tape cartridge comprises a means for mounting a cartridge to a deck plate and a means for guiding the external portion of the tape in a simple path parallel to the plane of the deck plate past one or more pickup heads and a driving capstan. The guide means includes two guide posts mounted on a separate mounting plate together with the pickup heads which are located therebetween. A third guide post is located between the trailing one of the first two posts and the entrance opening of the cartridge and a directly driven capstan for driving the tape is located between the latter two posts. The tape cartridge is mounted on the deck plate in a tilted fashion to cooperate with the guide posts in providing a planar path of travel for the entire external loop of the tape.

3,612,541
CARTRIDGE LOCKING MECHANISM

William B. Huber, Park Forest, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Mar. 12, 1969, Ser. No. 806,492
Int. Cl. G11b *5/00*
U.S. Cl. 274—4 R 6 Claims

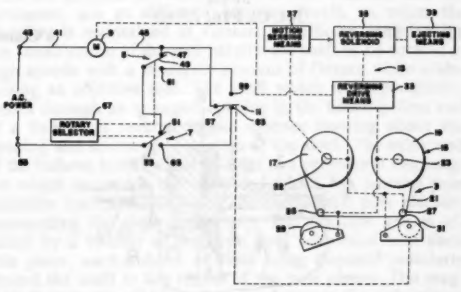


A cartridge locking mechanism for a cartridge or cassette tape player includes a pair of L-shaped spring members which are integrally molded on each side of a plastic housing providing a cavity for receiving the cartridges, with one end of each of the L-shaped spring members being formed with and attached to the housing. The other ends of the integral spring members extend into the cavity and into the path of a cartridge which is inserted therein. The spring members are cammed out of engagement with the front surface of the cartridge when a cartridge is inserted into the cavity and are shaped to fit into and engage a slot on each side of the cartridge when it is fully inserted into the cavity into a tape-playing position. In this position, the spring members hold the cartridge locked into position until it is manually removed from the cavity.

3,612,542
TRACK SELECTOR SYSTEM FOR A CASSETTE PLAYBACK DEVICE

Donald W. Marcinkus, Arlington Heights, Ill., assignor to Ampex Corporation, Redwood City, Calif.

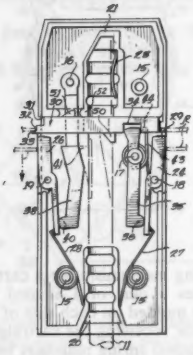
Filed Nov. 19, 1969, Ser. No. 877,971
Int. Cl. G11b *15/44*
U.S. Cl. 274—4 D 3 Claims



A track selector system for a cassette changer of the type in which a series of cassettes carried in a magazine are

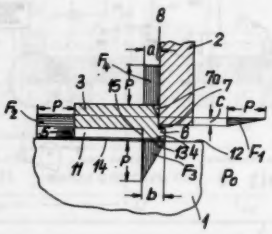
lowered in sequence into position to be played back by a playback device. The system includes a pair of switches which are actuated in different combinations of switching positions to provide a side 1 only, a side 2 only and both sides 1 and 2 switching positions. The system energizes a drive motor in the playback device if the switching position of the pair of switches corresponds with the position of a third or sensing switch which senses the direction of playback called for by the playback device. Otherwise, a control circuit is energized to either reverse the direction of playback or eject the cassette.

3,612,543
ADAPTER SPINDLE
Wilbert W. Redmer, Boca Raton, Fla., assignor to Redmer Sons Company, Franklin Park, Ill.
Filed Sept. 3, 1969, Ser. No. 854,918
Int. Cl. G11b *17/04*
U.S. Cl. 274—105 **9 Claims**



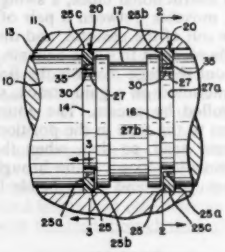
An adapter spindle for use with phonograph records having a large centerhole, which is adapted to slip over a conventional small diameter center spindle of a record changer. The adapter spindle includes a generally rectangular, flat housing, two retractable record supporting shelves, and a record separator member which controls the records supported by the spindle so only the lowermost record falls to the turntable when the record supporting shelves are retracted.

3,612,544
TORQUE RESPONSIVE FLEXIBLE SEALING RING
Peter Muller; Werner Schroder, and Rudolf Prescher, all of Essen, Germany, assignors to Fried Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Dec. 2, 1969, Ser. No. 881,514
Claims priority, application Germany, Dec. 13, 1968, P 18 14 501.2
Int. Cl. F16j *15/40*
U.S. Cl. 277—25 **6 Claims**



A sealing structure for use between two structural members movable relative to each other and including a ring-formed elastically twistable sealing member therebetween, in response to pressure drop being pressed into sealing contact with one of the structural members. Projecting means are provided on one structural member relative to which the sealing member is thereby prevented form rotative movement in a direction transverse to pressure drop. Between the ring-formed elastically twistable sealing member and one structural member there is a first intermediate space closed against an adjoining surface and on the other hand open toward higher pressure. Between the ring-formed elastically twistable sealing member and another structural member there is a second intermediate space on the one hand joined to a narrow gap formation between the sealing member and the first structural member and on the other hand open toward higher pressure. In response to pressure built up in the gap due to dynamic impact pressure against damming means or strips while the first and second structural members move relative to each other, there occurs change of the gap so as to transform it into a wedge-shaped gap widening toward the side of higher pressure. The sealing member with narrow gap space surrounds the first structural member formed by a shaft and becomes pressed in axial direction against adjoining surface location of a second structural member by way of higher pressure prevailing in a first intermediate space.

3,612,545
RESTRAINER RING SEAL ASSEMBLY
Robert S. Storms, Dayton, Ohio, assignor to The Duriron Company, Inc., Dayton, Ohio
Filed June 10, 1968, Ser. No. 735,812
Int. Cl. F16j *9/00*; **F02f** *5/00*
U.S. Cl. 277—26 **10 Claims**

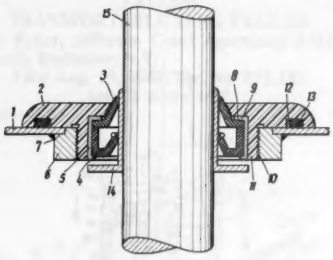


A seal assembly for a shaft movable relative to a housing includes a filled polytetrafluoroethylene (PTFE) seal element and a split restrainer ring received in a groove on the shaft, the restrainer being received in an annular chamber formed between the base of the groove and the inner periphery of the seal element. The restrainer ring keeps the seal element in engagement with the housing as the temperature is reduced by contracting until the spaced free ends are in abutting relation preventing further contraction of the ring and the seal element.

3,612,546
RECEPTACLE WITH SHAFT SEAL
Friedrich Otto, Hameln, Weser, Germany, assignor to A. Stephan U. Sohne, Hameln, Weser, Germany
Filed Apr. 10, 1970, Ser. No. 27,265
Claims priority, application Germany, Apr. 22, 1969, 6916004
Int. Cl. F16j *15/32*
U.S. Cl. 277—58 **14 Claims**

In a receptacle a wall is provided with an opening which extends from the inner side to the outer side of the receptacle. An annular member is located at the inner side releasably screwed into the opening and its aperture registers with the latter. A shaft extends through the opening and the aperture from the outer to the inner side of the receptacle and a sealing unit is replaceably carried by the annular member and separable from the wall together with the same. The sealing unit includes two axially spaced elastically yielda-

ble annular sealing elements each of which has an inner circumferential margin engaging the shaft means and an outer



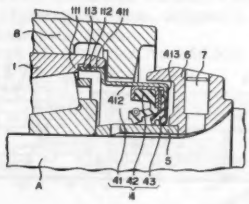
circumferential margin engaging the annular member, or a retaining ring located in the aperture of the annular member.

3,612,547

LUBRICANT SEAL HAVING CASING AND ITS HOLDING MEANS

Yoshiro Kan, Fujisawa-shi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 634,689, Apr. 28, 1967, Pat. No. 3,467,395
Filed Jan. 9, 1969, Ser. No. 810,059
Int. Cl. B65d *53/00*
U.S. Cl. 277—58 **2 Claims**



This disclosure describes a novel press-fitting fluidtight lubricant seal housing, an interlocking mounting bore, and novel lubricant and dust seals for use therein. The seal housing has an annular peripheral groove on the exterior sidewall, and the mounting bore has an annular peripheral projection or ring extending inwardly on the interior sidewall. The annular groove and projection interlock when the seal housing is telescoped into the mounting bore. An interior, cylindrical sidewall, connected to the exterior sidewall by a radially extending flange, has provision therein for retaining a dust seal element and an oil seal element. The oil seal has at least one seal lip at its inside peripheral portion extending axially inwardly. The dust seal lip is positioned adjacent the oil seal so as to form a pocket therebetween. The seal elements are made of separate pieces of elastomeric material.

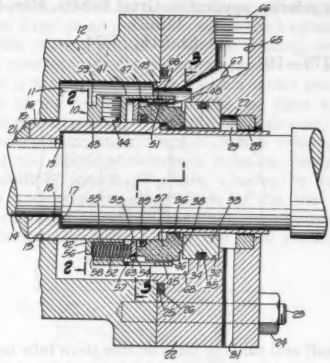
3,612,548

MECHANICAL SEAL SPRING HOLDER

Herbert E. Tracy, Alhambra, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 26, 1969, Ser. No. 880,253
Int. Cl. F16j *15/16, 15/40*
U.S. Cl. 277—74 **4 Claims**

A mechanical seal assembly of the type having a stationary face and a rotary face forming a sealing interface therebetween, the rotary face being spring-biased toward the stationary face, and including a spring holder having means whereby debris and contaminants which tend to accumulate



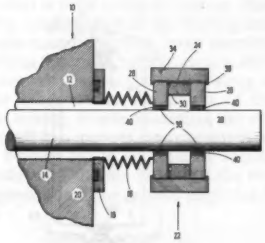
therein are ejected therefrom as the holder is rotated with the rotary seal.

3,612,549

PRESSURE SEAL

Melvin H. Berkowitz, 53 Sheldon Road, Newton, Mass.

Filed May 25, 1970, Ser. No. 40,155
Int. Cl. F16j *9/00;* **E21b** *33/00*
U.S. Cl. 277—80 **5 Claims**

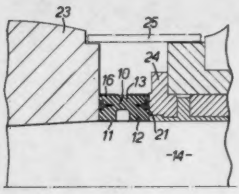


An improved hermetic seal between an enclosure and a shaft which projects and passes through the enclosure into the chamber within. The seal isolates the internal chamber from the ambient environment when the chamber and environment are at different pressure levels, as when the chamber is maintained at vacuum conditions. Additionally, the construction of the seal permits the shaft to be rotated at high speeds with a moderate amount of flexure while maintaining an effective seal. The shaft which is ferromagnetic, passes through an enlarged opening in the housing. One end of a bellows is secured to the exterior housing about the opening and surrounds a portion of the shaft. The other end of the bellows is sealed and secured to a permanent ring magnet which surrounds the shaft and which has annular pole elements spaced axially along the shaft, each pole element surrounding the shaft completely. The pressure seal is effected by a volume of magnetic fluid associated with each pole piece, each volume of fluid being disposed annularly around the shaft in the region of the pole pieces. The magnetic fluid bridges the annular gaps between the pole pieces and the shaft, the magnetic pole pieces and associated regions of the shaft being contacted intimately in sealed relation by the magnetic fluid and being maintained in this configuration by the magnetic pole pieces.

3,612,550
SHAFT SEALS

Samuel C. W. Wilkinson, Slough, England, assignor to Crane Packing Limited, Slough, England

Filed Feb. 26, 1970, Ser. No. 14,358
Claims priority, application Great Britain, Mar. 5, 1969, 11,653
Int. Cl. F16j *15/24*
U.S. Cl. 277—101 4 Claims

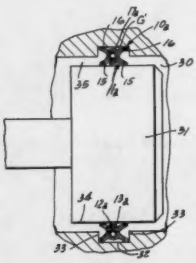


In a shaft seal suitable for a marine stern tube comprising a ring of resilient material of which the end faces are provided with annular thrust bearing surfaces, to facilitate assembly or replacement the ring is split by a longitudinal cut providing shaped cut faces of interengaging form that seal together on radially outward pressure, the split ring is enclosed by reinforcing bands and the thrust bearings are segmented.

3,612,551
BIDIRECTIONAL LIP SEAL

Paul Joseph Grabill, Jr., Sterling Heights, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 6, 1969, Ser. No. 874,628
Int. Cl. F16j *15/32*
U.S. Cl. 277—163 6 Claims



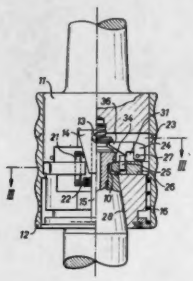
A circumferential spring-loaded plastics material packing ring particularly adapted for sealing relatively movable or stationary members, which has a generally X-shaped cross section providing a pair of diverging lips on each side thereof and a central peripheral groove receiving a circumferential spring to load the two lips on one periphery of the ring against one surface and to load the two lips on the other periphery of the ring against the other surface, thereby providing bidirectional sealing.

3,612,552
QUICK CHANGE TOOL HOLDER

Paul Brundler, Hinterbergstrasse, Galgenen, Switzerland

Filed Aug. 13, 1969, Ser. No. 849,670
Claims priority, application Switzerland, Aug. 21, 1968, 12 565/68
Int. Cl. B23b *31/12*
U.S. Cl. 279—1 B 7 Claims

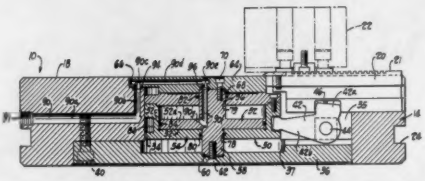
A quick change tool holder is arranged for tool change without stopping the tool spindle. The holder receives an arbor, the latter being engaged by segmental members in the holder body which are moved radially apart by wedges operated by a sliding sleeve on the outside of the holder. The segments are held in a released position after removal of the arbor by means of pawls engaging catch pins on the segments. Nose parts of the pawls engage a grooved ring spring mounted in the holder body and displaced on insertion of the arbor so that the segments are released. Limb portions of the segments then engage mating surfaces on the arbor which initiate acceleration of the arbor to the spindle speed after which the limbs enter slots in the arbor to give a positive drive.



3,612,553
LOW PROFILE FLUID ACTUATED CHUCK

George J. Ovanin, Euclid, Ohio, assignor to The S-P Manufacturing Corporation

Filed Feb. 28, 1969, Ser. No. 803,204
Int. Cl. B23b *31/30*
U.S. Cl. 279—4 11 Claims

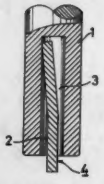


A chuck having a low profile, particularly suitable for use with drill presses or the like. An internal fluid motor with a fixed piston and a movable cylinder is operably connected to jaw operating linkages within the chuck which are located radially about the fluid motor.

3,612,554
SCREWDRIVER WITH SUBSTITUTABLE BIT

Katsuyuki Totsu, No. 4-7, 3-chome, oshiage, Sumida-ku, Tokyo, Japan

Filed June 18, 1968, Ser. No. 737,871
Claims priority, application Japan, June 24, 1967, Mar. 6, 1968, 42/40239;43/14040
Int. Cl. B25g *3/10*; B25b *15/00*
U.S. Cl. 279—102 9 Claims



This screwdriver comprises a sleeve shank which at its end portion is provided with a slot and a center cavity bisecting

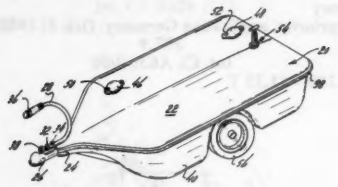
said slot into which a bit is substitutionally inserted. The sleeve shank end is covered with a sleeve adapter of plastic material which serves to hold and suspend the screw.

3,612,555

TRANSPORTABLE TANK TRAILER

Calvin Lee Baker, Jefferson Court Apartment 3242 Winton Road South, Rochester, N.Y.

Filed Aug. 19, 1969, Ser. No. 851,183
Int. Cl. B60p 3/22
U.S. Cl. 280—5 E 7 Claims



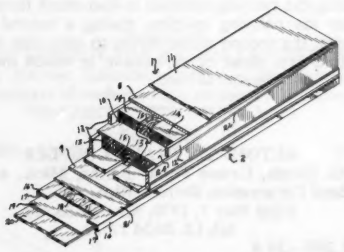
A transportable trailer of the type having an elongated liquid-holding tank, a pair of wheels supported beneath the tank, and a ball socket assembly supported in the fore portion of tank for connection to a towing vehicle. The tank includes one or more filling apertures in the top for draining of mobile camper or trailer holding tanks and a master drain in its aft portion for release of the stored contents into a park dumping station. The tank is especially adapted for dumping travel trailers at campgrounds and, thus, has a relatively low profile so as to be wheeled beneath conventional trailers.

3,612,556

SNOW SKI HAVING ANGULAR TORSION MEMBER

Robert R. Seawell, Minneapolis, Minn., assignor to Larson Industries, Inc., Minneapolis, Minn.

Filed Sept. 25, 1969, Ser. No. 860,924
Int. Cl. A63c 5/12
U.S. Cl. 280—11.13 L 6 Claims



A torsion plate embedded in the midportion of a snow ski intermediate the front and rear ends of the ski, the plate having one end portion disposed adjacent the top of the ski. The torsion plate slopes angularly downwardly from said one end portion thereof toward one end of the ski and terminates at its opposite end in upwardly spaced relation to the bottom of the ski.

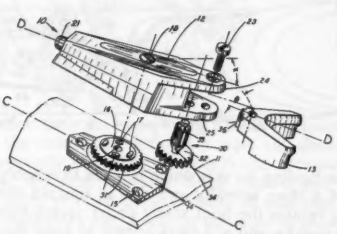
3,612,557

SKI BINDING HAVING IMPROVED TOE CLEAT INCLUDING ANTI-EARLY RELEASE LINKAGE

Bernard E. Berlenbach, Mill Valley, Calif., assignor to Ski Free Company, Mill Valley, Calif.

Filed Jan. 14, 1970, Ser. No. 2,721
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T 8 Claims

A toe cleat for a ski binding includes an anti-early release linkage for providing sufficient holding force to the sole of the skier's boot relative to the toe cleat. Operation of the linkage is initiated by sideward excursion of the rotational part of the ski binding; incremental angular rotation of such rotary part is translated to the toe cleat through the linkage. In one form, the linkage comprises a series of gears including a stationary spur gear in fixed engagement with the hub of the fixed portion of the ski binding; a pair of axially spaced pinion gears fixed on an upright common shaft rotatably connected to the moving portion of the ski binding; one pinion gear is in contact with the stationary gear, and the other pinion gear is in tangential contact with a sector gear formed at the hub of the toe cleat. Since the toe cleat is meshed through the pinion gears to the stationary spur gear, until the binding undergoes rotation, the toe cleat is solid to the ski runner. As the binding undergoes rotation, however, the common shaft is caused to rotate, causing, in turn, corresponding and proportional rotation of the toe cleat. In another form of the invention, the linkage comprises a fixed yoke positioned about the hub of the fixed portion of the



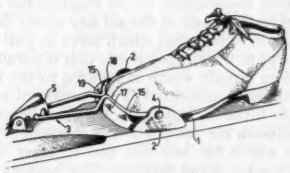
binding and a pair of lever members (bars) pivotally attached at one end, to the yoke, and, the other end, to a support for the toe cleat. Since the pivot points of levers are not coincident with the pivot point of the toe cleat, until the binding undergoes movement due to external forces acting on the binding, say as the skier loses his upright stability and starts to fall, the toe cleat is solid to the ski runner. However, when movement of the rotating part of the binding occurs, the toe cleat, cleat support and the twin lever members, are conveyed, in tandem, therewith which causes the connection points at the toe cleat support to move along arcuate pass centered at the other connection points of the levers. In either form, the linkage is seen to control the extent of rotation of the toe cleat in a manner concommitant with the rotation of the ski binding but in an opposite angular direction; and affix centerlines of the toe cleat and the skier's boot in coincident alignment until the release angle for the ski binding is achieved.

3,612,558

HOLDING ELEMENT FOR SKI BOOT

Alvar Eskil Petrus Kjellstrom, Sollentuna, and Ake Einar Charles Molin, Nybro, both of Sweden, assignors to AB Broderna Kjellstrom, Solna, Sweden

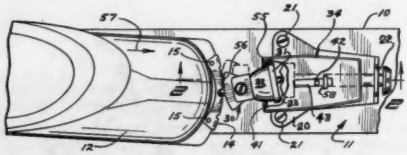
Filed Feb. 17, 1970, Ser. No. 11,963
Int. Cl. A63c 9/20
U.S. Cl. 280—11.35 B 7 Claims



A holding element for a boot intended for skiing which boot abuts with a forward section of its sole on both sides against a side support disposed on a ski binding, which prevents the movement of the boot sideways and forwards in relation to the ski, whereby the boot can be pressed by a

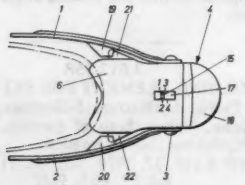
pivotably mounted shackle in the direction toward the ski in order to be held firmly in the binding, which shackle can be made to lie from above against the edge of the sole within at least a part of the said forward section, and can be locked in this position, the holding element being attached to the sole of the boot and having an upward projection which abuts against a forward portion of the shackle to retain the boot against backward movement along the ski.

3,612,559
TOE BINDING
Paul S. Petersen, Minnetonka; Roger D. Bloomfield, St. Louis Park, and Edward A. Pauls, Excelsior, all of Minn., assignors to Sports Technology, Inc., Edina, Minn.
Filed July 14, 1969, Ser. No. 841,315
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T **23 Claims**



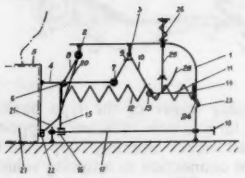
A toe binding for skis which is made to reliably release the boot of a skier laterally and also in upward direction. The binding retains the boot solely under spring force so it will absorb shocks, and will store energy to keep the boot in the binding at lower loads and will return the boot to a centered position if the boot moves but is not completely released. Because of the ability to provide a resetting force and permit some boot movement, the binding can be set at a lower ultimate release force to provide greater safety to skiers.

3,612,560
REAR TIGHTENER FOR SAFETY SKI BINDING
Bernd Payrhammer, Farchant, Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Germany
Filed July 23, 1969, Ser. No. 843,989
Claims priority, application Germany, Mar. 7, 1969, May 9, 1969, G 69 09 278.0–7402; P 19 23 882.5
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T **9 Claims**



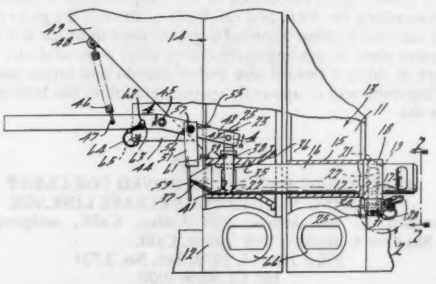
A boot-pushing member is rotatably mounted on an axle which extends transversely to the longitudinal axis of the ski and parallel to the tread of the ski and forms the web of a U-shaped member having legs which serve as pull rods and have free end portions which, on an axis that is parallel to the web, are pivoted to a plate which is secured to the ski. The boot-pushing member is subjected to the action of a spring, which produces the force for holding down the heel and the contact pressure between the toe portion of the skiing boot and a toe holder and which has one end that engages the axle which carries the boot-pushing member. The boot-pushing member is mounted on the axle by means of a slot and is slidable against the force of the spring so as to reduce the spacing of the sole-holding end of the boot-pushing member from the axle. The boot-pushing member has at least one laterally outwardly directed projection close to the sole-holding end, which projection serves to cooperate with a bracket, which extends inwardly from one leg of the U-shaped member, so that said bracket permits of a rotation of the boot-pushing member only when the sole-holding end has been displaced toward the axle. The sole-holding end lies over the straight line connecting the axle forming the web of the U-shaped member and the pivotal axis of the free end portions of the legs when the projection of the boot-pushing member engages the bracket from below.

3,612,561
HEEL-HOLDING DEVICE FOR SAFETY SKI BINDINGS
Hannes Marker, Garmisch-Partenkirchen, and Ludwig Axthammer, Schweinfurt Am Main, both of Germany, assignors to Hannes Marker, Garmisch-Partenkirchen, Germany
Claims priority, application Germany, Oct. 1, 1968, P 18 00 397.9
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T **13 Claims**



A carrying member for a soleholder is biased by a spring. A heel-holding device is adapted to automatically assume a locking position in response to the introduction of a skiing boot and to be opened arbitrarily, for example, by the application of a slight pressure with the ski pole on a release member, or automatically in response to an excessive tensile force acting substantially in an upward vertical direction. The carrying member forms a coupler link of a four-bar linkage, which has two cranks of equal length, to which the carrying member is pivotally connected and which are pivoted in a housing on horizontal transverse axes spaced the same distance apart as the pivotal axes of the carrying member. The transverse axes lie in the housing in an approximately horizontal plane. The spring acts on the carrying member by the crank which is remote from the soleholder. The pivot connecting the carrying member to that crank forms also the pivot for the carrying member during a second phase of movement, the second phase serves to open the device and succeeds a first phase of movement, in which the carrying member moves parallel to itself.

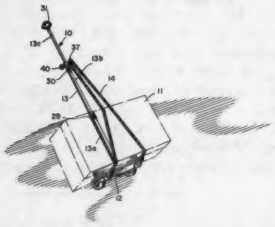
3,612,562
AUTOMATIC FRAME COUPLER
Adam D. Sweda, Grosse Pointe Farms, Mich., assignor to Fruehauf Corporation, Detroit, Mich.
Filed May 7, 1970, Ser. No. 35,525
Int. Cl. B62d 21/12
U.S. Cl. 280—34 A **7 Claims**



The coupler joins two chassis frames to form an elongated unit which can be transported by a tractor. The front end of

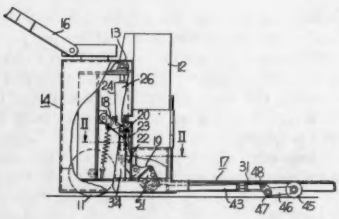
each frame has a pin in each corner which extends outwardly from the front of the frame. The rear end of each frame has two apertures aligned with the pins for receiving the extending ends of the pins of a second frame which are automatically locked within the apertures to couple the one end of one frame to the other end of a second frame.

3,612,563
COLLAPSIBLE SUITCASE CARRIER
Eugene A. Kazmark, Sr., 5 Remin Lane, Joliet, Ill.
Continuation-in-part of application Ser. No. 685,072, Nov. 22, 1967, now abandoned. This application Feb. 6, 1970, Ser. No. 9,147
Int. Cl. B62b *1/12*
U.S. Cl. 280—36 C 2 Claims



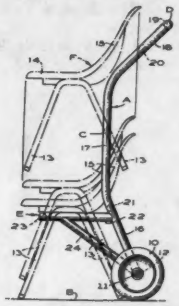
A collapsible suitcase carrier for transporting suitcases and the like. The carrier is provided with a dolly which includes an elongated L-shaped supporting bracket provided with a pair of wheels. An elongated handle is removably attached to the dolly, and the handle may be formed in sections which may be taken apart or telescoped to reduce the length of the handle to a compact size. The carrier also includes a strap, both ends of which are attached to the dolly. The supporting bracket is adapted to receive an edge of the suitcase to be carried, and the suitcase is further supported by the handle. The suitcase is firmly held against the supporting bracket and handle by passing the strap around the suitcase and securing the strap to the handle.

3,612,564
LIFT LINKAGE FOR WALKIE LIFT TRUCK
Dennis G. Harvey, Ancaster, Ontario, Canada, assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Jan. 16, 1970, Ser. No. 3,371
Int. Cl. B62d *21/18*
U.S. Cl. 280—43.12 4 Claims



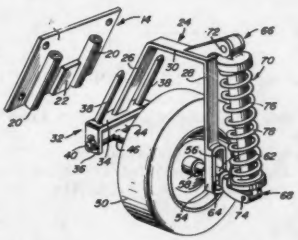
A lift linkage is provided for a low lift truck in which a pair of levers for operating the push-pull rods have extensions releasably secured thereto. The extensions are connectable to the levers in one of two laterally spaced mounting positions, thus permitting alternate attachment to load support attachments having wheel operating rods of different lateral spacing.

3,612,565
STACK-CHAIR DOLLY
Mike Zimmerman, 1279 California Drive, Burlingame, Calif.
Filed Nov. 24, 1969, Ser. No. 879,150
Int. Cl. B62b *1/18*
U.S. Cl. 280—47.24 2 Claims



A stack-chair dolly for transporting a stack of chairs nested one above the other, and defining a main roll-about frame having a forwardly projecting support frame secured to the main frame, the support frame being located and dimensioned for being inserted between pairs of side legs on the lowermost chair and under a seat on the latter so as to lift the stack of chairs when the main frame is tilted rearwardly about wheels of the dolly, whereby the stack of chairs may be readily transported from place to place, the support frame being insertable from the rear of the stack and the main frame defining a cradle to prevent the chairs from shifting laterally during transportation.

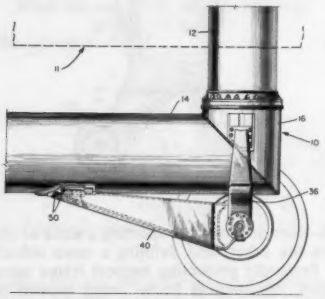
3,612,566
REMOVABLE SUPPORT WHEEL ASSEMBLY
Cecil R. Sholl, P.O. Box 681, Kodiak, Alaska
Filed Apr. 15, 1970, Ser. No. 28,826
Int. Cl. B60g *3/02*
U.S. Cl. 280—47.32 9 Claims



A wheel mount for removable support from one side of a boat and including an inverted generally U-shaped bridge projecting outwardly from the boat side. The bridge is defined by a pair of upstanding less interconnected at their upper ends by means of a rigid bight portion and one leg of the bridge is rigidly braced relative to the corresponding boat. An axle assembly is pivotally supported at one end portion from the lower end of the inside leg of the bridge for oscillation about a horizontal axis disposed generally normal to the plane in which the bridge is disposed for vertical swinging movement of that portion of the axle disposed adjacent the lower end of the outer leg of the bridge. A wheel is journaled on that portion of the axle extending between the lower ends of the legs of the bridge and spring structure is connected between the outer end of the bight portion of the bridge and the outer end portion of the axle which projects outwardly of the lower end of the outer leg of the bridge. The spring structure yieldingly biases the outer end of the axle

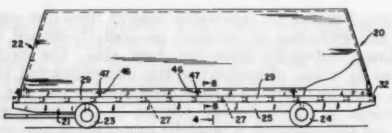
downwardly and the outer leg of the bridge and the axle include coacting portions limiting vertical swinging movement of the axle and guiding the outer end of the axle against deflection out of the plane in which it is vertically swingable.

3,612,567
REAR AXLE ASSEMBLY
Walter S. Eggert, Jr., Huntingdon Valley, Pa., assignor to Booth Airside Services, Inc.
Filed Sept. 2, 1969, Ser. No. 854,696
Int. Cl. B60g *1/02*
U.S. Cl. 280—80 R **2 Claims**



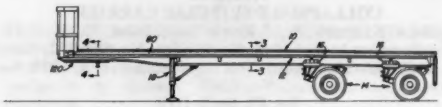
An unsprung rear axle assembly for a vehicle having a chassis which includes a main horizontal support beam and a vertical post upon which a passenger pod is adapted to be moved up and down. The axle assembly is in the form of a truss which includes vertical diagonal struts connected from the ends of the axle to the vertical post to resist lateral overturning moments which may be applied through the vertical post. The assembly further includes horizontal diagonal struts connected from the ends of the axle to the horizontal beam to resist braking moments and longitudinal forces when the vehicle is slowed down or stopped. Shear blocks are affixed to the chassis to permit accurate alignment of the ends of the vertical and horizontal struts thereby aiding in the assembly, disassembly and reassembly of the axle assembly from the chassis while still maintaining accurate alignment of the parts involved.

3,612,568
STEERABLY WHEELED TRANSPORTABLE CARGO CONTAINER
Arney C. Stensrud, c/o Transpor Trailer, Inc. 333 W. 1st St., Dayton, Ohio
Continuation-in-part of application Ser. No. 795,189, Jan. 30, 1969, now abandoned. This application Aug. 20, 1970, Ser. No. 65,419
Int. Cl. B60p *1/00*
U.S. Cl. 280—103 **13 Claims**



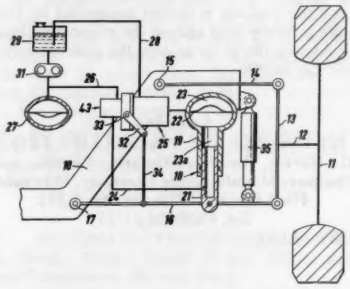
The invention comprises a cargo container for use in loading merchandise onto auto hauling railway cars and trailers and the like, said container having flat bed member with wheels mounted thereon and a tow rod for towing the container from place to place, a removable top member, said flat bed member having narrow upright flanges along its outer edge, and said removable top having channel portions along its lower edge for mounting over said flanges to mount said top member to said flat bed member.

3,612,569
TRAILER CONSTRUCTION
Joseph A. Marinelli, 14 W. Hazelcroft Ave., New Castle, Pa.
Filed Jan. 29, 1969, Ser. No. 794,944
Int. Cl. B62d *53/06*
U.S. Cl. 280—106 **13 Claims**



A trailer construction including a plurality of longitudinally extending transversely spaced main beams each fabricated to include a longitudinal upwardly convex bow. The longitudinal beams are interconnected by means of transverse bracing members extending and secured therebetween and a central longitudinal decking structure is secured over and between the main beams while longitudinal opposite side decking structures are supported in cantilever fashion from and project outwardly of the remote sides of the main beams. Also, the forward end of the trailer includes a fabricated sheet steel fifth wheel plate keyed into and secured to and between the forward ends of the main beams.

3,612,570
SUSPENSION SYSTEMS FOR VEHICLES
Robert Hazell Pitcher, Leamington Spa; Michael W. Lewis, Solihull, and Stephen J. Crouch, Solihull, all of England, assignors to Automotive Products Company Limited, Leamington Spa, England
Filed Jan. 15, 1969, Ser. No. 791,233
Claims priority, application Great Britain, Jan. 15, 1968, 2112/68
Int. Cl. B60g *17/04*
U.S. Cl. 280—124 F **6 Claims**

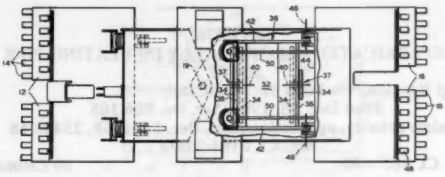


A suspension arrangement for a vehicle in which there is interposed between the sprung mass of the vehicle and a wheel or other supporting element thereof a variable-length liquid-filled strut associated with a suspension spring device, a valve controlling the flow of liquid into and out of the strut to adjust its length is acted on by an inertia mass movably mounted on the sprung mass of the vehicle and acted on by relative movements of the sprung mass and the supporting element which movements are transmitted to the inertia mass through a resilient link acting in parallel with means providing velocity feedback.

3,612,571
VEHICLE SUSPENSION MECHANISM
Gene F. Hand, Stevensville, and Robert L. Siewert, St. Joseph, both of Mich., assignors to Clark Equipment Company
Filed Oct. 27, 1969, Ser. No. 869,605
Int. Cl. B60g *9/02*
U.S. Cl. 280—124 R **7 Claims**

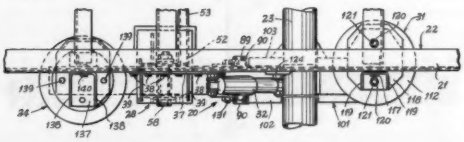
A suspension mechanism including a cradle which is pivoted on the frame of the vehicle about a longitudinal axis.

An axle support member is secured to an axle and also is pivotally mounted on the cradle about a transverse axis.



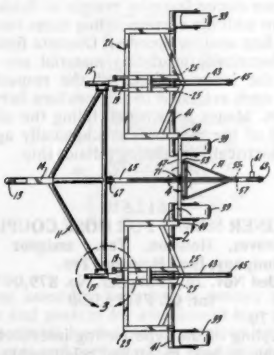
There is an additional connection between the axle support member and the cradle which restrains pivotal motion between the axle support member and the cradle.

3,612,572
AIRLIFT SUSPENSION ASSEMBLY
John E. Raidel, Springfield, Mo., assignor to Ridewell Corporation, Springfield, Mo.
Filed Sept. 17, 1969, Ser. No. 858,732
Int. Cl. B60g *9/02*
U.S. Cl. 280—124 **7 Claims**



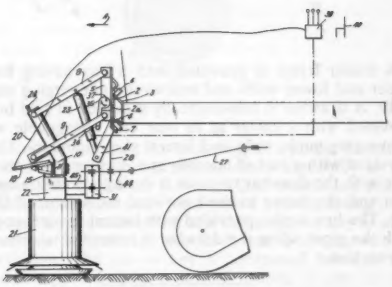
A vehicle suspension assembly designed to support a vehicle axle assembly and cushion and dampen shock when the axle moves either upward or downward of its normal position, and adjustable for different positions of the vehicle axle. The damping is provided by a pair of opposed air springs. The adjustability is provided by a mount that supports one end of the suspension assembly and is slidable on a hanger assembly to adjust the position of the suspension assembly. Also certain parts of the suspension assembly are invertible for accommodating substantial variations in axle location. Adjustable eccentrics in the slidable mount permit alignment of the axle.

3,612,573
GANG MOWER
James E. Hoffman, Glenview, Ill., assignor to Roseman Mower Corporation, Glenview, Ill.
Filed Apr. 6, 1970, Ser. No. 26,000
Int. Cl. B62d *53/00*
U.S. Cl. 280—411 C **5 Claims**



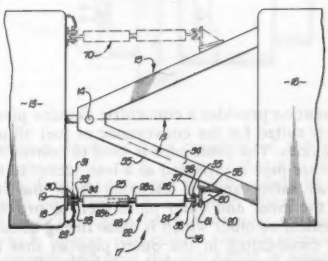
A gang mower having a center frame, a right frame and a left side frame. The side frames are adapted to have mowers attached thereto and an additional mower is towed rearwardly of the side frames. The side frames are independently connected to the main frame to permit each side frame to pivot about both a transverse axis and a longitudinal axis while restraining the side frames against movement about vertical axes. The side frames are connected to each other by a spacer bar which is pivotally connected at its opposite ends to the side frames. A boom is supported on the spacer bar and is pivotally connected at its forward end to the main frame. The boom is mounted to move vertically relative to said spacer bar for a limited distance.

3,612,574
HITCH AND POWER-TAKEOFF ASSEMBLY FOR CONNECTING FARM IMPLEMENTS TO A VEHICLE
Emil Klopfer, Engen; Martin Stelzle, Gottmadingen, and Edwin Schneble, Gailingen, all of Germany, assignors to Maschienenfabrik Fahr AG, Gottmadingen, Germany
Filed May 5, 1969, Ser. No. 821,707
Int. Cl. B60d *1/00*
U.S. Cl. 280—467 **10 Claims**



A self-propelled farm vehicle, e.g. a crop-pickup loader or wagon, is fitted with a horizontal profiled bumper of noncircular cross section along which an implement hitch or support can ride. This support is provided with a hydraulic cylinder which operates a parallelogrammatic linkage connected to a generally upright member which can be lifted or lowered relative to the bumper or crossbar. A generally cylindrical coupling bolt having a narrow end is mounted on this vertical member and is adapted to engage in a confronting hole on a farm implement. A locking pawl catching in a groove on the bolt holds the implement in place while allowing it to swing from side to side to a limited extent. A power-takeoff shaft is journaled in a plate pivoted about a horizontal axis on the bumper and is coupled with a pivotal chain transmission on the implement.

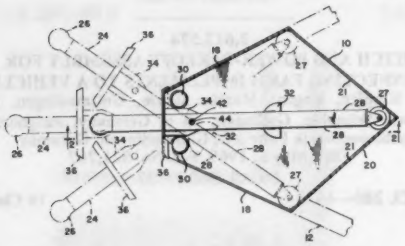
3,612,575
TRAILER BACKING GUIDE
Jack B. Stewart, 10441 E. Bisby St., El Monte, Calif.
Filed Jan. 16, 1970, Ser. No. 3,294
Int. Cl. B62d *53/00*
U.S. Cl. 280—474 **8 Claims**



A backing guide for a trailer includes multiple brackets connectable to pulled and pulling units and an elongated

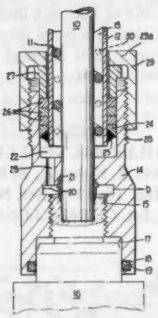
guide bar releasably connectable with the brackets, the bar being lengthwise adjustable.

3,612,576
TRAILER HITCH
Melvin L. Marler, P.O. Box 325, Bremerton, Wash.
Filed Aug. 21, 1969, Ser. No. 851,962
Int. Cl. B60d 7/00
U.S. Cl. 280—478 B 3 Claims



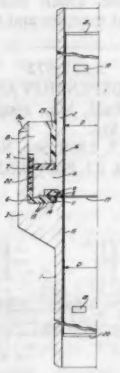
A trailer frame is provided with a box having horizontal upper and lower walls and rearwardly converging rear guide walls. A drawbar is telescopically mounted in said box and is provided with a caster at its rear end engageable with said converging guide walls and lateral stop members. The box is provided with a pair of laterally spaced pipes that are engageable with the drawbar to guide it during retraction and extension and also serve to limit outward movement of the drawbar. The box is also provided with lateral spacers engageable with the pipes when the drawbar is retracted to assure a tight connection.

3,612,577
CONCENTRIC PIPES WITH DRAIN MEANS
Joseph Albert Pope, Birmingham, England, and Colin William Dawson, Cooksville, Ontario, Canada, assignors to Mirrless Blackstone Limited
Filed Oct. 29, 1969, Ser. No. 872,062
Claims priority, application Great Britain, Oct. 30, 1968, 51351/68
Int. Cl. F16l 55/00
U.S. Cl. 285—14 3 Claims



The invention provides a concentric circular pipe assembly particularly suited for the conveyance of fuel oil under pressure to engines. The inner pipe is used to convey the fuel oil and the outer pipe is provided as a leak jacket to collect and drain away safely any oil escaping from the inner pipe. Between the inner and outer pipes there is provided an expanded helical member which is close fitting about the inner pipe and close-fitting in the outer pipe so that both pipes derive support from one another over helical line contact and this permits bending of the pipes without significant loss of circularity or concentricity and also permits drainage of fluid from the outer pipe. The pipes are terminated with concentric connectors through one of which fluid in the outer pipe can drain.

3,612,578
PREFABRICATED ELECTRICALLY INSULATING PIPE JOINT
Luigi Bagnulo, Via Volta 18, Milan, Italy
Filed Dec. 18, 1969, Ser. No. 886,105
Claims priority, application Italy, Dec. 21, 1968, 25488 68
Int. Cl. F16l 55/00
U.S. Cl. 285—50 10 Claims

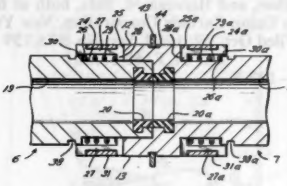


A first pipe of metallic material has a cup-shaped socket at one end, and a second pipe of metallic material has a flange at one end which is received with clearance in the socket of the first pipe. The bottom wall of the socket is juxtaposed with the axial end face of the flange. The latter is provided in this axial end face with an annular groove concentric with the pipe and having an inner diameter equal to the inner diameter of the pipe and an outer diameter smaller than the outer diameter of the flange. An annular member of rigid electrically insulating material is fixedly received in this groove, having an inner diameter at least substantially equal to the inner diameter of the first groove. A second annular groove is provided in the bottom face of the socket and has an outer diameter at least equal to the outer diameter of the flange and an inner diameter larger than the inner diameter of the first groove but smaller than the outer diameter of the same. A second annular member of elastically yieldable electrically insulating material is received in the second groove and has an inner circumferential margin in fluidetightly sealing engagement with the corresponding outer circumferential margin of the first annular member. Discrete first and second coatings of electrically insulating material are respectively provided on the inner surfaces of the respective tubular members and each extended to the juncture between the tubular members. Means is provided filling the clearance and connecting all of the members mechanically against movement and in electrically insulating relationship.

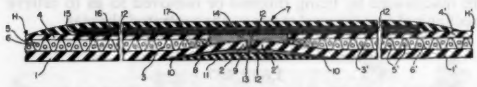
3,612,579
RETAINER MEANS FOR HOSE COUPLING
Harry L. Groves, Houston, Tex., assignor to National Coupling Company, Inc., Houston, Tex.
Filed Nov. 24, 1969, Ser. No. 879,097
Int. Cl. F16l 55/00
U.S. Cl. 285—70 4 Claims

A hose coupling of the type having interlatching retainer jaws which may be held in latched relationship by one or a pair of opposed, resiliently biased collars is provided with a secondary retainer element in the form of a wire or snap ring which is applied to the coupling in position to resist

detachment of the latching jaws. This element may encompass and directly block the jaws themselves or the coupling body adjacent the collar or one of the collars to prevent its retraction.

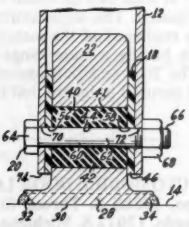


3,612,580
HOSE SPLICE
Lawrence R. Jones, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed May 20, 1970, Ser. No. 39,052
Int. Cl. F16l 31/00
U.S. Cl. 285—293 11 Claims



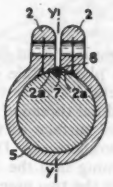
A hose splice for joining adjacent lengths or segments of reinforced hose having a tube, at least one hose reinforcing layer and a cover. The splice construction includes a tapered inner sealing ring of flexible, elastomeric material bonded to the inner surface of the hose tube which acts to distribute the stresses to which the splice is subjected, at least one splice reinforcing layer or ply surrounding and bonded to each hose segment and a splice cover of flexible material surrounding and bonded to the radially outermost splicing ply. The splice construction may also include an outer sealing ring surrounding the hose tubes and bonded to the innermost splice ply. The splice is particularly suitable for field splicing operations.

3,612,581
CANOPY MOUNT
Edward V. Frankenberg, and Norman N. Griffith, both of Jacksonville, Fla., assignors to Fleco Corporation, Jacksonville, Fla.
Filed Nov. 18, 1969, Ser. No. 877,672
Int. Cl. F16b 9/00
U.S. Cl. 287—20 11 Claims



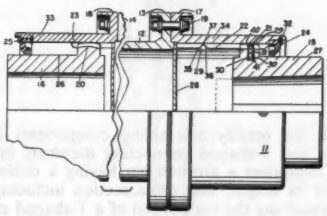
A mounting assembly including a canopy post having a hollow lower end portion for attachment to a tractor frame, an upright pedestal having an upper free end adapted to receive the lower end portion of the canopy post therearound and a lower end secured to the tractor frame. The upright pedestal has a horizontal passageway extending therethrough with cushioning means positioned within the passageway and having an elongated opening passing therethrough. A bolt extends through the lower end portion of the canopy post for connecting same to the pedestal with the bolt passing through the elongated opening within the cushioning means. The bolt is in contact with and supported by the cushioning means and maintains the lower end of the canopy post spacedly above the tractor frame.

3,612,582
SHAFT ASSEMBLIES
Alfred Pitner, Paris, France, assignor to Nadella, Rueil-Malmaison, France
Filed Sept. 4, 1969, Ser. No. 855,116
Claims priority, application France, Mar. 20, 1969, Nov. 29, 1968, Sept. 5, 1968, 6908026;175 966;165 125
Int. Cl. F16b 7/00
U.S. Cl. 287—52.05 9 Claims



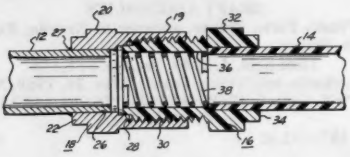
The invention concerns the mounting of a power transmission member on a shaft and relates more especially to the mounting of universal joint yokes on their associated shafts. The invention provides each yoke with a hub for fitting over the shaft and a generally cylindrical dowel pin or key is used both to secure the yoke on the shaft and to fix the two in driving relation. The pin or key is interposed between the shaft and the yoke hub in a seating formed in one or the other either by driving in the pin or key, itself acting as a punch tool for this purpose, or by using a punch of which at least the working part has a shape identical to that of the pin or key. In another feature of the invention, a die tool slidable in a die assembly for holding the shaft and the pin is used to press the pin into the shaft to form the latter with a seating for the pin.

3,612,583
DETENT MECHANISM FOR DISCONNECT COUPLING
Norman J. Anderson, Erie, Pa., assignor to Zurn Industries, Inc., Erie, Pa.
Continuation-in-part of application Ser. No. 676,809, Oct. 20, 1967, now Patent No. 3,475,043. This application Aug. 11, 1969, Ser. No. 849,134
Int. Cl. F16d 1/00
U.S. Cl. 287—104 3 Claims



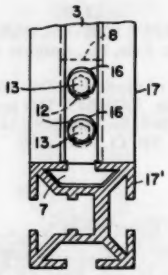
The invention disclosed is a coupling of the gear type which is constructed in such a manner that one of its hubs can be moved from a connected position where its teeth engage the teeth on a sleeve, to a position where its teeth are disengaged from the sleeve teeth. Particular shaped locking plungers which engage particularly shaped recesses in the sleeve are provided to hold the hub either in locked or unlocked position. The particular shape of the plungers and grooves resist movement of the sleeve.

3,612,584
TEMPERATURE COMPENSATED FLUID COUPLING
Philip W. Taylor, Howell, Mich., assignor to Taylor Industries Inc.
Filed Oct. 16, 1969, Ser. No. 866,899
Int. Cl. F16l 55/00
U.S. Cl. 285—174 7 Claims



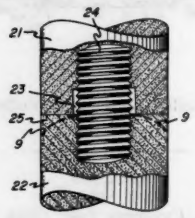
A temperature compensated fluid coupling for connecting two pipes and having a plastic male connector adapted for connection within a metalic female connector. The female connector has a longitudinal threaded bore which is engaged by a threaded peripheral surface of the male connector to form a fluidtight seal therebetween. The male connector has a longitudinal bore opening into the female bore to permit the flow of fluid between the two pipes, and is provided with a helicoidal spring exerting a force against the surface of the male bore to urge the same outwardly, thereby expanding the outer peripheral threaded surface thereof to maintain a fluidtight engagement with the female threads when the female and male connectors separate diametrically when subjected to temperature change.

3,612,585
READILY ASSEMBLABLE STRUCTURAL COMPONENTS
Franz Josef Mayr, Monchaltorf, Brunacker, Switzerland
Filed Feb. 11, 1969, Ser. No. 798,324
Claims priority, application Switzerland, Mar. 28, 1968, June 19, 1968, 5218/68;9464/68
Int. Cl. F16b 5/00
U.S. Cl. 287—189.36 C 10 Claims



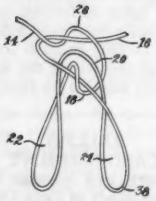
A system for readily assembling components including profile bars and T-shaped connecting members into structural units comprises a profiled bar having a uniform cross section over its length, said cross section including groove means for receiving the leg portion of a T-shaped connector member, which groove means are formed by a channel portion including a web, two legs extending from the web, and a pair of flanges extending from the legs toward each other, and slot means for receiving a crossbar portion of the T-shaped connector including branches which extend from the said channel portion towards one side of the channel, a second pair of flanges extending from the branches toward each other along a line spaced outwardly from the channel portion to points spaced from each other to define a slot on the side of the bar which is wider than the thickness of the leg portion of the T-shaped connector and less than the length of the crossbar portion.

3,612,586
ASYMMETRIC JOINT FOR CONNECTING CARBON ELECTRODES
Harry C. Stieber, and Herman M. Belz, both of Berea, Ohio, assignors to Union Carbide Corporation, New York, N.Y.
Filed Oct. 29, 1969, Ser. No. 873,139
Int. Cl. F16b 21/20
U.S. Cl. 287—127 E 9 Claims



An electrode joint having female end face electrode sections coupled together by a male-threaded nipple wherein the threads adjacent the joint face in the upper electrode section are inactivated by being thinned or removed so as to relieve mechanical and thermal stresses concentrated thereat.

3,612,587
UNIVERSAL RESILIENT PACKAGE-TYING DEVICE AND METHOD FOR ITS ASSEMBLY
Marion Sturm Rubin, 1833 E. 16th St., Brooklyn, N.Y.
Filed Apr. 18, 1969, Ser. No. 817,531
Int. Cl. B65h 69/04
U.S. Cl. 289—1.2 15 Claims

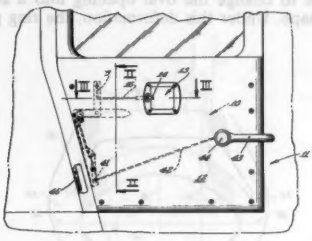


A universal package-tying device and the method of its assembly wherein a length of resilient material is formed into a plurality of loops, at least two of which can be mutually and simultaneously adjusted. The adjustability of at least two of the loops and the resiliency of the material used permits the tying of packages having a wide range of dimensions and configurations. The free end portions of the package-tying device are fixedly secured to insure that the device will be reliable in service.

3,612,588
AUTOMOBILE DOOR LOCK
Anthony J. Roppo, 12508 S. Throop St., Chicago, Ill., and Edmund J. Langdo, 12012 S. Michigan, Chicago, Ill.
Filed Jan. 22, 1970, Ser. No.4,926
Int. Cl. E05c 19/00
U.S. Cl. 292—1 2 Claims

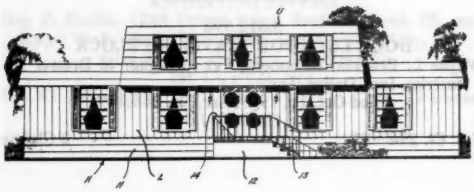
An automobile safety door lock which is positioned so that it cannot be reached by a wire, coat hanger or other tool from the outside through a slight opening of the window so as to prevent theft and tampering with a vehicle. The lock is mounted in a recessed well formed in the interior surface of the door which can be easily reached by an occupant within the vehicle but cannot be moved from outside the vehicle

with a wire or other tool so as to unlock the door from the outside. The recessed lock also improves the safety of the



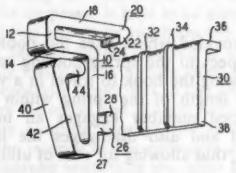
passengers as it is mounted so that it will not be hit by a passenger during an accident.

3,612,589
MULTILEVEL HOUSE TRAILER
Harry W. Locher, Jr., Houston, Tex., assignor to Pyramid Industries, Inc.
Filed July 2, 1969, Ser. No. 838,452
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 6 Claims



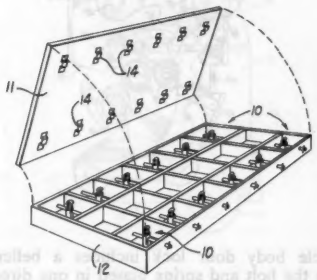
A multilevel house trailer suitable for movement along public roads or highways in which the upper level is retractable into the lower level, including means for elevating and lowering such upper level with respect to the lower level.

3,612,590
QUICK-MOUNTING HARDWARE
John Andreini, Irvington, N.J.; Edwin Harley Borchard, Boulder; Karl-Heinz Pohl, Boulder, Colo., and Joseph Anthony Puccio, East Brunswick, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 28, 1970, Ser. No. 67,904
Int. Cl. E05c *19/02*
U.S. Cl. 292—76 11 Claims



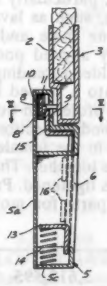
Snap-on hardware mounted on a structural component having a pair of spaced ridges extending intermediate and transverse to a pair of lips, the hardware comprising a strap for occupying the space between the ridges and an L-shaped finger at one end of the strap for extending behind one of the lips. A flexible cantilevered arm extends from the other end of the strap in the same direction as the finger and includes a catch at the free end thereof for snapping over the other lip to secure the hardware in place. A functional portion extends from the strap or the finger.

3,612,591
REMOTELY OPERATED CLAMP
Clifford L. Barnes, Apple Creek, Ohio, assignor to Wooster Products, Inc., Wooster, Ohio
Filed Jan. 7, 1970, Ser. No. 1,254
Int. Cl. E05c *5/02, 19/14*
U.S. Cl. 292—110 7 Claims



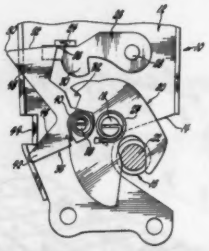
A clamp for detachably securing two structures together includes a clamp-supporting member movable on one structure and a clamp assembly carried by the supporting member. The clamp assembly includes a clamp body rigidly supporting a clamp element, and a spring for urging the body to a first position relative to the support member. The supporting member is moved to engage the clamping element with a clamp surface on the other structure and to deflect the spring whereby the clamp element and clamp surface are urged together under the force of the deflected spring. The supporting member is manually operated and readily accessible.

3,612,592
LOCK FOR A CARRYING CASE
Georg Reitzel, Altenmittlau Kreis, Gelnhausen, Germany, assignor to Drescher & Kiefer, Gelnhausen, Germany and Randolph-Rand Corporation, New York, N.Y., part interest to each
Filed Mar. 19, 1969, Ser. No. 808,479
Claims priority, application Germany, Apr. 17, 1968, D 38 003/68a Gbm
Int. Cl. E05b *65/50*
U.S. Cl. 292—175 4 Claims



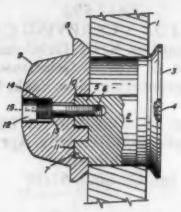
A lock for a briefcase or similar carrying case has a catch member fastened to the closure flap of the case and a receiver fastened to the front wall of the case. The catch member when locked to the receiver is flush therewith and the release button of the lock is fitted in a recess of the casing of the receiver so that no movable part of the lock protrudes from the front wall of the receiver.

3,612,593
VEHICLE BODY DOOR LOCK
Ramon L. Bessette, East Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 27, 1970, Ser. No. 23,315
Int. Cl. E05c 3/26
U.S. Cl. 292—216 3 Claims



A vehicle body door lock includes a bellcrank lever pivoted to the bolt and spring biased in one direction. One leg of the bellcrank is engageable with the latch frame to control the position of the bellcrank with respect to the bolt and locate the other leg of the bellcrank in engagement with the detent to maintain the detent out of engagement with the bolt in all positions of the bolt except fully latched.

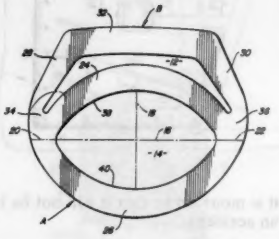
3,612,594
FASTENING DEVICE FOR DOORKNOB ASSEMBLIES
Gus Constantino Scutari, Brooklyn, N.Y., assignor to Formica Corporation, Cincinnati, Ohio
Filed Aug. 25, 1970, Ser. No. 66,819
Int. Cl. E05b 1/00
U.S. Cl. 292—347 5 Claims



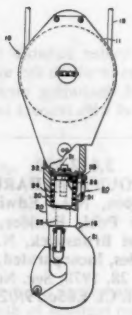
Doorknob assemblies, particularly for doors to be opened primarily from one side, such as lavatory doors, are in the form of two knobs, one male and one female, fastened together in permanently aligned position by a bolt with a recessed head and shoulder extending through the center of the female knob and into a tapped hole in the male knob. This tapped hole is in a projection fitting into a recess in the female knob, and a second projection offset from the center fits into another recess in the female knob, so that the two knobs are locked to turn together. The projections seat in the recesses when the bolt is tightened. Preferably the male knob carries the customary parts for moving a latch when the knobs are turned.

3,612,595
CONTAINER HANDLE
Alfred V. Updegraff, Lakewood, and Lawrence A. Beyer, Shaker Heights, both of Ohio, assignors to The Haynes Manufacturing Company, Cleveland, Ohio
Filed Nov. 12, 1969, Ser. No. 875,945
Int. Cl. A47j 45/00
U.S. Cl. 294—31.2 3 Claims

A container handle is punched or cut from a flat sheet of polyethylene so as to have a ring portion with a substantially oval opening therein. The oval opening has a major axis and a minor axis and the arms of a bail are integrally formed with the ring portion. The arms are connected with the ring portion in areas adjacent points where the major axis of the oval opening intersects the ring portion. The ring portion is deformable to change the oval opening into a substantially circular shape. Under this deformation, the ring portion adjacent the intersection of the major axis curves upwardly so as to slope downwardly on opposite sides of the major axis. The arms of the bail are connected with the ring portion at one of the downward sloping areas so that the bail is biased downwardly to tightly hug a jar or bottle on which the container handle is fitted.



3,612,596
HOOK LOCK FOR TRAVELING BLOCK
Wayne L. Brackin, Beaumont, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Oct. 16, 1969, Ser. No. 866,849
Int. Cl. B66c 1/34
U.S. Cl. 294—82 2 Claims

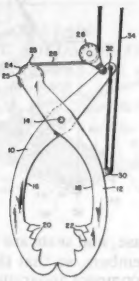


A lock is provided which fixes the hook on a traveling block with respect to the spring housing and block, at the same time allowing the hook to travel in a vertical direction the customary length of the spring within the housing. A pivoted L-shaped member engages an index ring by a downward pull and also disengages the index ring by a downward pull, thus allowing for ease of utility.

3,612,597
LOG GRAPPLE
Albert R. Wirkkala, Naselle, Wash.
Filed June 3, 1969, Ser. No. 829,889
Int. Cl. B66c 1/22, 1/44
U.S. Cl. 294—112 1 Claim

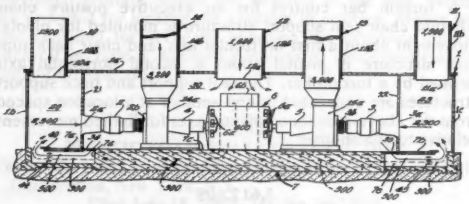
A log grapple having use in grapple-yarding and log-loading operations is characterized by a pair of crossed jaws pivotally joined about one-third of the length thereof from their upper ends, a supporting and closing line attached to

one of the jaws and extending about a sheave wheel attached to the other of the jaws for closing the jaws around a log on



upward pull of the line, and an opening line attached to either of the jaws for opening the jaws when pulled upwardly.

3,612,598
POWER PLANT HAVING COMPRESSOR-POWERED ASPIRATING SYSTEM
Roy P. Keslin, 1240 Prince Drive, South Holland, Ill., and Ralph W. Keslin, 1428 Stateline Ave., Calumet City, Ill.
Filed Mar. 6, 1969, Ser. No. 804,830
Int. Cl. H02k *7/18*
U.S. Cl. 290—52 **9 Claims**

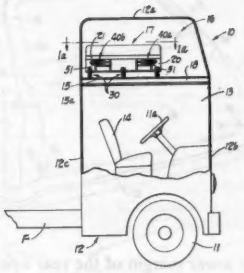


An enclosure for a gas turbine power plant in which the noise of the ventilating and the fuel air is at a minimum will be provided by the structure of the invention wherein the entering and exhausting air volume as well as the openings through which the air passes is kept to an absolute minimum. Three inlets and two outlets to and from the atmosphere include a primary fuel air supply opening at each end of the building generally above a gas turbine inlet, a secondary air supply opening centrally positioned in the enclosure and an exhaust vent from the outlet end of each turbine. The portion of the air supply entering through the second opening is drawn through the interior of the enclosure and through the generator itself thereby ventilating the latter before the air is burnt in the gas turbine. Careful design of the openings in accordance with the fuel air requirements of the turbine assures that while only the exact amount of air necessary to operate the turbines enters the enclosure, a portion of it provides the additional function of ventilating the enclosure and the generator.

ERRATUM

For Class 296—23 see:
Patent No. 3,612,589

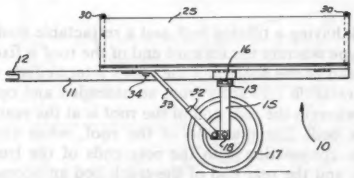
3,612,599
OVER-THE-HIGHWAY TRUCK CAB
Ernest Robert Sternberg, Rocky River, Ohio, assignor to White Motor Corporation, Cleveland, Ohio
Filed July 16, 1969, Ser. No. 842,145
Int. Cl. B62d *25/00*
U.S. Cl. 296—24 **16 Claims**



A cab for a highway truck or tractor is disclosed in which a sleeping compartment including a sleeper bunk assembly is located between a ceiling of the driver's compartment and the roof of the cab.

A bunk assembly for highway vehicles is disclosed including frame members connected to the vehicle by resilient support structures for enabling relative movement of the bunk vertically with respect to the vehicle and thereby dampening vertical shock loads. A mattress-supporting pallet extends between the frame members and second support structures are located between the pallet and the frame. These support structures enable motion of the pallet in forward and rearward directions in the vehicle so that shock loads from pitching are minimized.

3,612,600
FOLDING UTILITY TRAILER
Luis G. Salichs, 44-15 25th St., Santa Rosa Bayaman, P.R.
Filed May 28, 1970, Ser. No. 41,263
Int. Cl. B60p *3/34*
U.S. Cl. 296—27 **6 Claims**

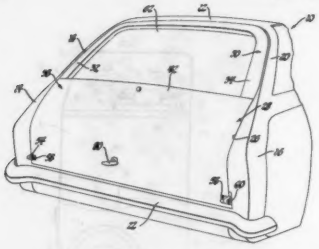


A folding utility trailer which while retaining its full length is folded to a width slightly wider than the width of an individual wheel. The wheels are moved to a tandem position supporting the folded trailer so that it can be rolled to and from a storage position.

3,612,601
VEHICLE CLOSURE ARRANGEMENT
John Farmington Himka, and Samuel C. Pollock, both of Rochester, Minn., assignors to General Motors Corporation, Detroit, Mich.
Filed Jan. 26, 1970, Ser. No. 5,788
Int. Cl. B60j *5/10*
U.S. Cl. 296—51 **3 Claims**

A tailgate assembly on the body member of a station wagon-type vehicle is moveable from a closed position closing the rear access opening to a first open position as a conventional drop-gate or to a second opened position as a liftgate, and includes a frame member swingable about a

horizontal transverse axis at the upper margin of the rear opening and a gate member swingable relative to the frame member about an axis thereof. In one position of the frame member the aforementioned axis thereof about which the tailgate member swings is oriented transversely of the body



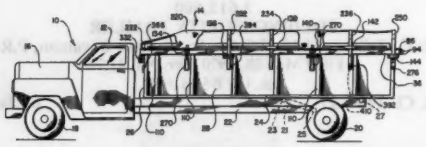
member at the lower margin of the rear opening so that the swinging movement of the gate member relative to the body member and the frame member is equivalent to conventional drop-gate operation while the gate member is swingable as a unit with the frame member as a lift-gate to completely expose the rear opening.

3,612,602

TRUCK WITH RETRACTABLE ROOF AND CLOSABLE ACCESS OPENING

Lowell G. Stepp, Syracuse, Kans.

Division of Ser. No. 658,414, Aug. 4, 1967, Pat. No. 3,481,645
Filed Nov. 26, 1969, Ser. No. 880,042
Int. Cl. B62d *25/06*
U.S. Cl. 296—106 6 Claims



A truck having a tiltable bed, and a retractable roof of the flexible type wherein the forward end of the roof is fixed with the rear end of the roof (and the roof's intermediate extent) being retractable forwardly from an extended and operative position wherein the rear end of the roof is at the rear end of the truck bed. The rear end of the roof, when extended, defines in conjunction with the rear ends of the truck bed sidewalls, and the rear end of the truck bed an access opening. Closure means is provided for selectively opening and closing the access opening, with such means including a pivotally mounted wall having a free edge of a shape conformable to the shape of the rear end of the roof, whereby such free edge and the rear end of the roof mate in closing relationship on the roof being extended and the wall being pivoted to its closing position. Means is provided for releasably retaining the wall in its closing position.

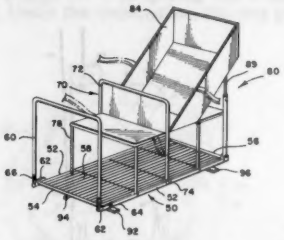
3,612,603

TANDEM STROLLER

David E. Snyder, and Joy G. Snyder, both of 5344 Pendleton St., San Diego, Calif.

Filed Jan. 21, 1969, Ser. No. 792,329
Int. Cl. A47d *1/10*
U.S. Cl. 297—130 5 Claims

A horizontal stroller frame with a detachable tandem seat assembly is disclosed herein. First, second and third upstanding members laterally span a base which is anchored on a stroller frame. The first member is a bumper handhold combination, and the second and third upright members are seats. In a preferred embodiment of the invention, the upright members comprise U-shaped tubes hinged at op-



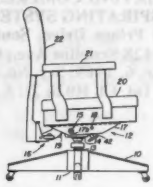
posite ends to the base, and seats are hinged medially on the second and third members, so that the entire assembly may be folded into a flat compact apparatus.

3,612,604

TORSION BAR CONTROL FOR EXECUTIVE POSTURE CHAIR

James R. Meinhardt, Park Ridge, Ill., assignor to The Seng Company

Filed Aug. 17, 1966, Ser. No. 573,089
Int. Cl. A47c *3/00*
U.S. Cl. 297—303 4 Claims



A torsion bar control for an executive posture chair wherein chair seat support structure is mounted for pivotal movement about a first horizontal axis, and chair back support structure is pivotal about a second horizontal axis defined by a torsion bar. The seat support and back support structures are connected to one another at a location spaced from the above-mentioned pivotal axes for limited movement relative to one another.

3,612,605

RESTRAINING DEVICE

John T. Posey, Jr., 1739 Meadowbrook Road, Altadena, Calif.

Filed Oct. 17, 1969, Ser. No. 867,135
Int. Cl. A47c *31/00*
U.S. Cl. 297—389 2 Claims

A device for restraining a patient in a chair comprising a belt adapted to be wrapped around the midriff of the patient

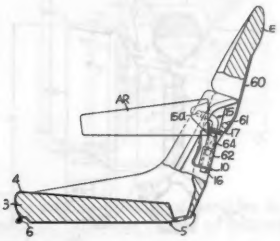
and releasably secured behind the back of the chair, and a pair of straps secured to the belt in front of the patient and extending diagonally upwardly across the front of the patient, over his shoulders, and down behind the back of the chair where they are releasably secured to the belt.

3,612,606

SEAT HAVING FOLDABLE ARMRESTS

Richard F. Swenson, Milwaukee, Wis., assignor to Swenson Corporation, Red Granite, Wis.

Filed Sept. 3, 1970, Ser. No. 69,367
Int. Cl. A47c *7/54*
U.S. Cl. 297—417 **21 Claims**



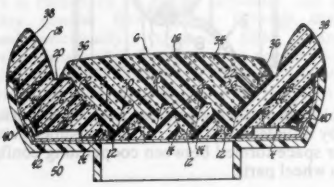
A seat for tractors or the like, which seat has foldable armrests that can be swung from a normal forwardly facing position to a rearward position behind the backrest and out of the way. Means are provided for swingably mounting the armrests so they may be first swung approximately 90° and then to a vertical storage position behind the seat. Alternatively, the armrests can be swung about 180° from the forwardly facing position and to a directly rearwardly facing position, and then can be swung laterally to an approximately horizontal position behind the backrest of the seat. Means are provided for locking the armrests in position. Means are also provided for vertically adjusting the extension of the backrest in various adjusted positions to accommodate the back of the operator.

3,612,607

PLASTIC FOAM SEAT CONSTRUCTION

Thomas E. Lohr, Warren, Mich., assignor to Allied Chemicals Corporation, New York, N.Y.

Filed July 18, 1969, Ser. No. 843,054
Int. Cl. A47c *7/02, 1/12*
U.S. Cl. 297—452 **7 Claims**



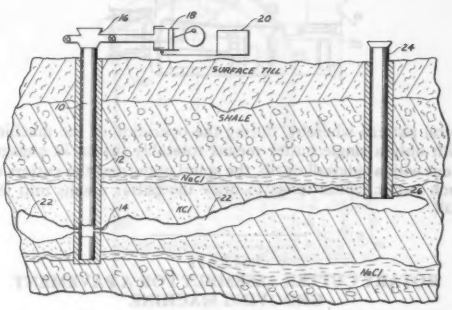
A vehicle seat made up of a supporting slab of relatively hard, high density elastomeric urethane foam and a cushion mounted on said supporting slab of relatively soft, low density elastomeric urethane foam that is softer and more compressible than the material of the supporting slab, with interlocking means between the cushion and slab for preventing relative sliding movement between the cushion and slab. The cushion and slab are detachably secured together against separation by a suitable pressure sensitive adhesive so that the cushion can be removed and replaced when damaged.

3,612,608

PROCESS TO ESTABLISH COMMUNICATION BETWEEN WELLS IN MINERAL FORMATIONS

Edgar A. Manker, Alsancak Izmir, Turkey; Thomas Wachtell, Rolling Hills, Calif., and Donald E. Garrett, Claremont, Calif., assignors to Occidental Petroleum Corporation

Filed Oct. 2, 1969, Ser. No. 863,091
Int. Cl. E21b *43/28*
U.S. Cl. 299—1 **19 Claims**



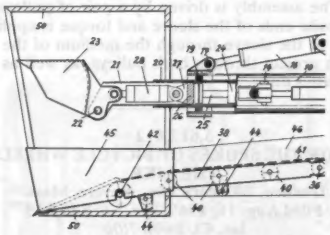
A solution mining operation is established by drilling a well into a soluble salt formation, hydraulically creating and maintaining a fracture pool, defining the area of the fracture pool by surface measurement and drilling at least one other well in the defined fracture pool area to establish communication.

3,612,609

DEVICE FOR THE DEMOLISHING AND REMOVAL OF EARTHWORK

Josef Reuls, Kt. Bern, Switzerland, assignor to Hydrel A.G. Maschinenfabrik, Romanshorn, Switzerland

Filed July 3, 1969, Ser. No. 838,810
Claims priority, application Switzerland, July 9, 1968, 10504/68
Int. Cl. E01g *31/03*
U.S. Cl. 299—33 **7 Claims**



A soil excavator includes a framework supporting a tubular boom for universal motion, a shovel being rotatably and extensibly carried on the free end of a nest of telescoped tubes lodged in the boom. The framework may be anchored to a concrete shell introduced into the tunnel wall behind an advancing cutter shield.

3,612,610

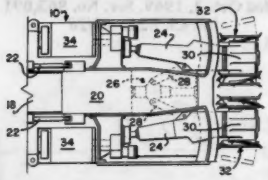
CONTINUOUS MINER HAVING OSCILLATING ROTARY CUTTER MEANS WITH SPIRALLY ARRANGED CUTTERS

Einar M. Arentzen, Charleroi, Pa., assignor to Lee-Norse Company, Charleroi, Pa.

Filed Jan. 13, 1970, Ser. No. 2,545
Int. Cl. E21c *27/24*
U.S. Cl. 299—71 **3 Claims**

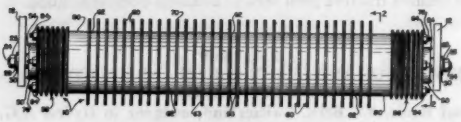
A continuous miner comprising a chassis which mounts a vertically movable boom supporting a pair of cutter carriers

continuously laterally oscillated towards and away from each other during the normal operation of the machine. Rotatably driven cutter means are carried by the forward end of each carrier, the cutter means each including cutters disposed in a



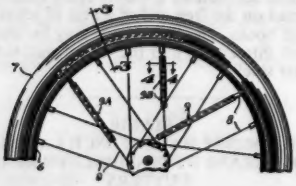
spiral pattern whereby, during the operation of the machine with only a single cutter means rotatably driven in engagement with a sidewall or rib, the spiral pattern of the cutters of such cutter means tends to draw the cutter means into the wall.

3,612,611
ROTARY CUTTER ASSEMBLY FOR A PAVEMENT GROOVING MACHINE
Stafford M. Ellis, Kent, England, assignor to Concut, Inc., Toledo, Ohio
Filed Apr. 16, 1970, Ser. No. 29,107
Int. Cl. E01c *23/09*
U.S. Cl. 299—89 **11 Claims**



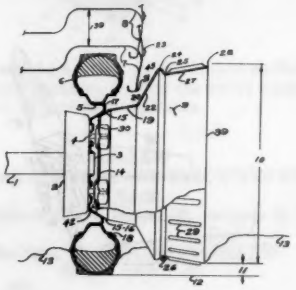
A rotary cutter head designed for use with tractionally driven pavement grooving machines. A large multiplicity of slightly spaced, radially disposed cutter disks having abrasive peripheries are clamped together by through bolts and mounted on a rotary tubular sleeve which is supported at its end on a fixed central supporting shaft by means of roller bearings. The assembly is driven by a pair of pulleys carried at the opposite ends of the sleeve and torque is applied from the pulleys to the sleeve through the medium of the through bolts which project through both pulleys, as well as through all of the cutter disks.

3,612,612
CLIPS FOR THE SPOKES OF BICYCLE WHEELS AND THE LIKE
Mathew R. Gannon, 243 Park Ave., Revere, Mass.
Filed Aug. 11, 1969, Ser. No. 849,043
Int. Cl. B60b *7/00*
U.S. Cl. 301—37 SA **2 Claims**



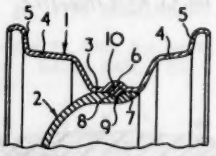
Clips for the spokes of bicycle wheels and the like are disclosed, each clip being in the form of an extruded, flexible, plastic length of a cross-sectional size and shape to receive and enclose a bicycle spoke with marginal portions extending substantially in abutment from end-to-end of the clip and operable to permit attachment. The coloring of the plastic materials is preferably with irridescent pigments.

3,612,613
AUXILIARY SUPPORTING, TRACTIVE AND CAPSTAN WHEEL FOR VEHICLES
Alfred J. Tricon, 9654 Winsome Lane, Houston, Tex.
Continuation-in-part of Ser. No. 832,370, July 24, 1969, abandoned
Filed Apr. 23, 1970, Ser. No. 31,299
Int. Cl. B60b *15/26*
U.S. Cl. 301—41 **4 Claims**



This invention is an auxiliary wheel which can be added to the standard propelling and supporting wheels of a vehicle to provide additional support, additional traction and may also be used separately or simultaneously as a capstan to provide additional propulsive force for the vehicle. The design of this invention is such that the standard propelling wheels need not be removed, the vehicle need not be elevated, and in the case of many vehicles such as standard passenger automobiles, the body or fender structure of the vehicle need not be modified.

3,612,614
VEHICLE WHEELS
Peter G. Ware, Rugby, England, assignor to Dunlop Holdings Limited, London, England
Filed Feb. 28, 1969, Ser. No. 803,198
Claims priority, application Great Britain, Mar. 15, 1968, May 1, 1968, 12585/68;22771/68
Int. Cl. B60b *23/00*
U.S. Cl. 301—63 R **24 Claims**

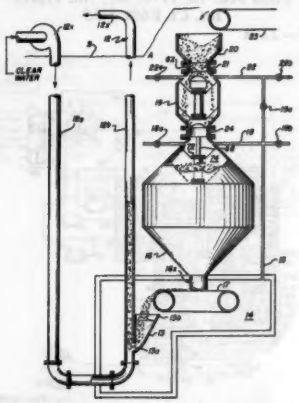


A vehicle wheel having at least two wheel parts secured together by an injected plastic locking member contained in an annular space formed between cooperating configurations of the two wheel parts.

3,612,615
CONTINUOUS HYDRAULIC ORE HOISTING SYSTEM
Water R. Allen, P.O. Box 311, Durand, Mich.
Filed Sept. 30, 1969, Ser. No. 862,178
Int. Cl. B65g *53/30*
U.S. Cl. 302—14 **13 Claims**

A continuous hydraulic ore hoisting system in which ore or other solids in transportable sizes are introduced through a free water surface into a confined cyclic flow of a transport fluid at a controlled rate by directing pneumatic pressure against the liquid interface at one or more lower points of introduction, each maintained in balanced relation to pressures

within an associated surge bin and interconnected pressurized chamber. The confined flow has a critical velocity



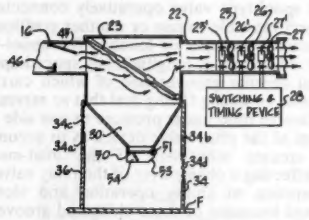
greater than the settling velocity of particles in the flow and may be hoisted and otherwise moved to desired locations including an upper outlet.

3,612,616

TEXTILE MACHINE FIBER WASTE DISPOSAL SYSTEM

Richard Gordon Stewart, Heaton Moore, Nr. Manchester, England, assignor to Parks-Cramer (Great Britain), Ltd., Oldham, Lancashire, England

Filed Apr. 4, 1969, Ser. No. 813,533
Int. Cl. B65g *53/04*
U.S. Cl. 302—27 **8 Claims**



A pneumatic conveyor extending from a plurality of textile machines is connected to a filter separator unit in which a momentary reverse flow of air through the filter is established periodically to clean the filter. Means are provided for automatically obstructing the pneumatic conveyor against the reverse flow of air therethrough, and other means are provided for automatically opening the filter separator unit to the discharge of collected fiber waste therefrom, whenever the reverse flow of air occurs and in response thereto.

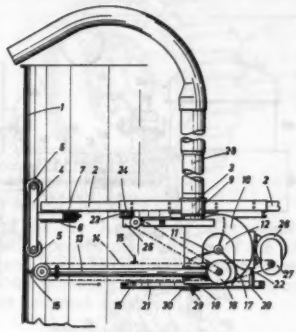
3,612,617

TOP-UNLOADED SILO

Karl Scherz, Hauptplatz 7, Deutschlandsberg, Austria

Filed July 15, 1969, Ser. No. 841,854
Claims priority, application Austria, July 19, 1968, A 6960/68
Int. Cl. B65g *53/40*; A01f
U.S. Cl. 302—56 **14 Claims**

A silo has a sidewall which is adapted to hold silage. Top unloading apparatus comprises a plate support adapted to rest on said silage and having an aperture, a conveyor having a carrier which is connected to the top of said plate support for limited pivotal movement relative thereto in all directions and for rotation with said plate support, and conveying means carried by said carrier and extending through said aperture to said silage, conveyor drive means operable to cause said conveying means to remove material from said silage and move said removed material toward said axis, a guide spider which is disposed above said conveyor and vertically guided on the inside surface of said sidewall and provided with means holding said spider in a horizontal orientation and with a bearing, in which said conveyor carrier is mounted for rotation about said axis, a horizontal drive ring centered on the axis of said silo, and rotating drive means operable to rotate said carrier and plate support about the axis of said silo and comprising a pinion in rolling engagement with said drive ring.

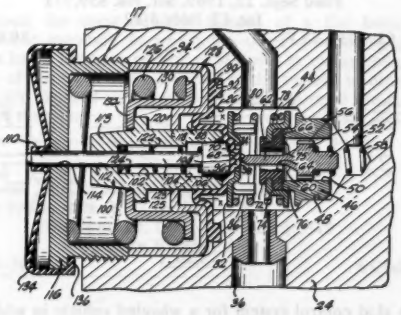


3,612,618

PRESSURE-SENSITIVE METERING VALVE

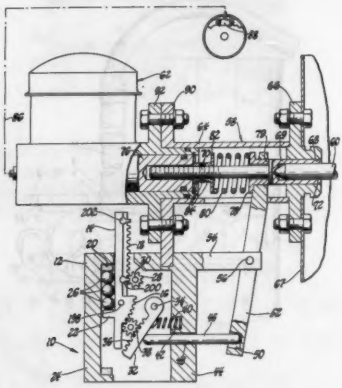
Kenneth B. Swanson, Bannister, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 6, 1969, Ser. No. 874,484
Int. Cl. B60t *8/26, 11/34*
U.S. Cl. 303—6 C **10 Claims**



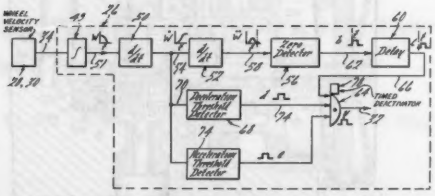
A pressure-sensitive metering valve for use in hydraulic brake systems of automotive vehicles wherein the front wheels of the vehicle are provided with disc-type brakes and the rear wheels of the vehicle are provided with drum-type brakes, the metering valve being solely pressure sensitive and being effective to establish a fluid pressure differential between the disc brakes and the drum brakes, to withhold the application of fluid pressure to the disc brakes over a predetermined range of fluid pressure and thereafter being effective to reduce the pressure differential at a linear rate over a second range of fluid pressure independently of the rate of manual application of the brakes.

3,612,619
SAFETY BRAKE APPARATUS
Henry L. Hayes, 496 E. Baker, Clawson, Mich.
Continuation-in-part of application Ser. No. 801,618, Feb. 24, 1969, now Patent No. 3,549,207. This application Apr. 23, 1970, Ser. No. 31,113
Int. Cl. B60t 7/12
U.S. Cl. 303—18 12 Claims



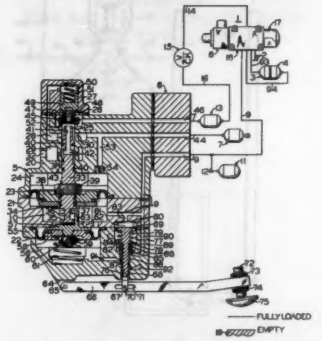
Apparatus for applying the hydraulic brakes of a vehicle upon opening a door and releasing the brakes when the vehicle is conditioned for normal driving. In the illustrated embodiment the opening of a door actuates a reversible electric motor which drives a cam member through a housing, thus, rotating a pinion which meshes with a pivotally mounted rack arm. The rack arm operates through a lever to depress an output plunger which is mechanically connected between a brake actuator rod and the piston of a master cylinder. Thus, vehicle brakes may be applied either through the automatic door opening responsive system or through the normal brake pedal.

3,612,620
SKID CONTROL SYSTEM
Hugh E. Riordan, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Sept. 22, 1969, Ser. No. 859,771
Int. Cl. B60t 8/12
U.S. Cl. 303—21 P 10 Claims



A skid control system for a wheeled vehicle in which the brake pressure is released at or near the point of optimum retarding force comprising a rate of change of wheel angular deceleration detecting circuit including a zero detector and delay circuit which provides a control signal indicative of optimum braking to a brake pressure modulator which releases the brakes upon receipt of the control signal and an incipient skid signal generated upon detection of wheel deceleration exceeding a predetermined level, and a timed deactivator which deactivates the brake pressure modulator at a predetermined time after pressure is released. A speed modulator and mu detector, may be optionally provided, which adjust the delay interval in accordance with vehicle speed and mu between the wheel and the road surface so that the delay is decreased at low vehicle velocities or low mu conditions.

3,612,621
RELAY VALVE WITH LOAD SENSING MEANS
Daniel G. Scott, Apollo, Pa., assignor to Westinghouse Air Brake Company, Willmerding, Pa.
Filed Feb. 16, 1970, Ser. No. 11,812
Int. Cl. B60t 8/18
U.S. Cl. 303—22 R 12 Claims

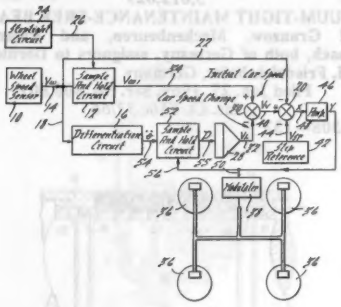


This invention relates to a railway vehicle double-abutment relay valve device for interposition between a brake control pipe and a brake cylinder and includes a novel mechanism adjustable accordingly as the vehicle is empty or loaded to so condition the relay valve device that its operation by fluid under pressure from the brake control pipe always provides a supply of fluid under pressure to the brake cylinder, the value of which is in accordance with the weight of the load carried by a spring-supported (or sprung) part of the vehicle between which and an unsprung part, the relay valve device is interposed for effecting operation of the novel load-measuring or sensing mechanism thereof in accordance with changes in the load carried by the spring-supported part. The novel load-sensing mechanism includes a fluid pressure operated spool-type valve operatively connected to a load-sensing arm movable to one or another position accordingly as the vehicle is empty or loaded. The spool-type valve is provided with a pair of longitudinally spaced-apart elongated peripheral annular grooves one of which carries therein a reciprocable or sliding O-ring seal that so serves as a valve to control flow of fluid under pressure to one side of one of the abutments of the relay valve device as to accommodate substantial arcuate movement of the load-measuring arm without effecting a changeover of the relay valve device from load operation to empty operation and vice versa. The lengths and locations of these elongated grooves are such as to require that the movement of the spool valve in either direction, in response to the shocks, jolts, vertical movement and sidewise rocking experienced by the body of a railway vehicle while traveling at high speed, exceeds a chosen percentage of the total valve movement between empty and loaded positions before the O-ring seal is shifted from one end of its groove to another to thereby effect a change in the control of flow of fluid under pressure through a communication to one side of one of the abutments of the relay valve device to thereby render the one abutment effective or ineffective to cooperate with the other abutment to control operation of the relay valve device in accordance with the difference in the effective area of the pair of abutments, or in accordance with the effective area of the larger of the abutments.

3,612,622
SKID CONTROL SYSTEM
Hugh E. Riordan, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Feb. 27, 1969, Ser. No. 802,991
Int. Cl. B60t 8/08
U.S. Cl. 303—21 P 12 Claims

A skid control system for a wheeled vehicle varies the braking pressure as a function of the slip, the difference between vehicle speed and wheel speed. A vehicle analogue

circuit provides a signal V1 representative of the reduction in vehicle velocity during braking. The instantaneous vehicle velocity Vv is obtained by substracting the loss of vehicle velocity V1 from the initial vehicle velocity $Vw1$. The instan-



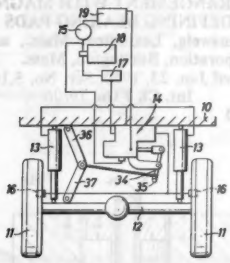
taneous vehicle velocity Vv is fed to a difference circuit which produces an output signal X when the wheel velocity Vw and a slip reference signal Vsr exceed signal Vv. Output signal X causes actuation of a modulator to relieve brake pressure.

3,612,623

VALVE MEANS FOR LIQUID PRESSURE SYSTEMS

Leslie C. Chouings, Leamington Spa, England, assignor to Automotive Products Company Limited, Leamington Spa, Warwickshire, England

Filed Sept. 22, 1969, Ser. No. 859,885
Claims priority, application Great Britain, Sept. 23, 1968, 45123/68
Int. Cl. B60t *8/18*
U.S. Cl. 303—22 A **2 Claims**



A valve device for use in a liquid pressure system on a vehicle to maintain the vehicle structure at a substantially constant level despite changes in the load carried thereby includes a valve spool activated by any tendency for the vehicle structure to rise or drop due to load changes to vary the liquid pressure in liquid filled struts supporting the said structure, the changes in liquid pressure also acting on a valve controlling the flow of liquid from a braking pressure source to brake motor cylinders, to provide a limit to the brake applying pressure acting in the motor cylinders which limit varies with the vehicle loading.

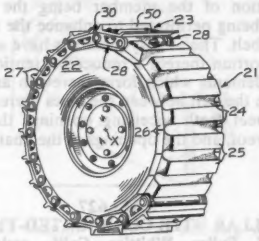
3,612,624

TRACK-OVER-TIRE DRIVING ARRANGEMENT

Robert N. Stedman, Peoria County, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 4, 1970, Ser. No. 8,506
Int. Cl. B62d *55/08*; **B60b** *15/18*
U.S. Cl. 305—19 **21 Claims**

A track-over-tire driving arrangement comprises a pneumatic tire having a plurality of equally spaced notches formed on the periphery thereof. An endless track assembly, completely wrapped around the tire, comprises a plurality of closely coupled ground-engaging track shoes connected together by an annular articulated link assembly positioned



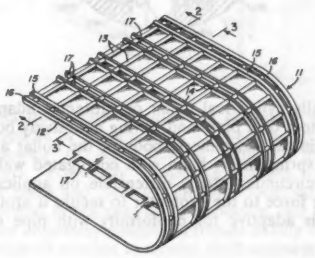
on each side of the tire. A common pivot means pivotally connects laterally opposed pairs of links of the link assemblies together and is totally confined within a respective one of the notches for providing a mechanical drive connection between the tire and track assembly.

3,612,625

TRACK FOR SNOW VEHICLES

Walter E. Huber, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Sept. 26, 1969, Ser. No. 861,377
Int. Cl. B62d *55/24*
U.S. Cl. 305—35 EB **5 Claims**



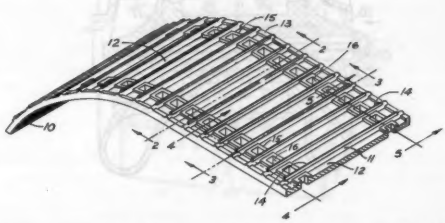
A track for snow vehicles formed of a flat band of elastomeric material, in which the outer ground-engaging surface has at least one pair of parallel ribs extending longitudinally of the track and outwardly of the surface to prevent lateral slip. Spaced sprocket holes extend through the track between the ribs.

3,612,626

SNOWMOBILE TRACTION BELT

Stanley F. Fuchs, Hwy. 51, Janesville, Wis.

Filed Sept. 12, 1969, Ser. No. 857,348
Int. Cl. B62d *55/24*
U.S. Cl. 305—38 **4 Claims**



A snowmobile traction endless belt of rubber having unitary reinforcing-and-cleat members of metal transverse thereof,

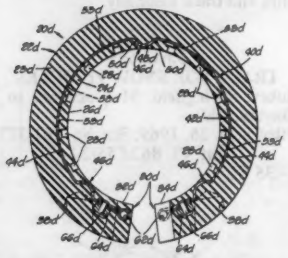
connected thereto solely by mold in-bonding, and partially embedded therein projecting therefrom at the ground-engaging face only. The belt has alternate thick and thin portions transverse thereof forming a corrugated ground-engaging face. The opposite face is flat. The unitary metal members are disposed in the thick portions of the belt, with the embedded portion of the member being the major portion thereof and being perforated to enhance the mold-in securement to the belt. The unitary members have at the end of the embedded portion thereof a reduced extension for receiving chain link elements which form therewith an endless chain embedded in the belt between the faces thereof. The belt has sprocket wheel teeth receiving openings through the thin portions thereof, and the openings of the chain are in registry therewith.

3,612,627

PIPE COLLAR WITH CORRUGATED-TYPE INSERT

Lawrence E. Fuller, Whittier, Calif., assignor to Byron Jackson, Inc., Long Beach, Calif.

Filed Sept. 23, 1969, Ser. No. 860,287
Int. Cl. F16c *1/26*
U.S. Cl. 308—4 A **8 Claims**



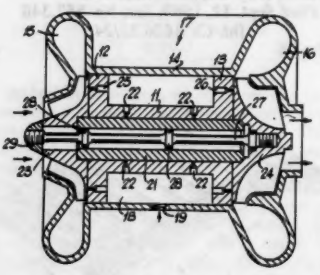
A generally cylindrical collar or protector adapted to be clamped into a drill pipe, and having adhesively bonded and embedded in the elastomeric body of the collar a generally cylindrical spring insert band with corrugated wall portions which are circumferentially distensible on application of a constrictive force to the protector to secure it around a pipe so that it is adaptive for conformity with pipe of varying diameters.

3,612,628

GAS BEARINGS

Henry Jack Steele, Moseley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Jan. 22, 1969, Ser. No. 792,919
Claims priority, application Great Britain, Jan. 22, 1968, 3213/68
Int. Cl. F16c *17/16*
U.S. Cl. 308—9 **1 Claim**



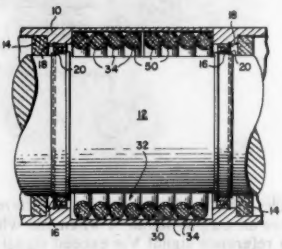
A gas bearing includes a stator assembly, a hollow ceramic shaft mounted for rotation within the stator assembly and passages in the stator assembly for the supply of gas between the stator assembly and shaft. At least one end of the shaft is secured to a component, and extending through the shaft is a tie bolt holding the component onto the shaft. The tie bolt is tightened to compress the shaft.

3,612,629

VACUUM-TIGHT MAINTENANCE-FREE BEARING

Manfred Granzow, Meckenbeuren, and Roland Vath, Fischbach, both of Germany, assignors to Dornier System GmbH, Friedrichshafen, Germany

Filed Jan. 27, 1969, Ser. No. 800,801
Int. Cl. F16c *33/66*
U.S. Cl. 308—132 **1 Claim**



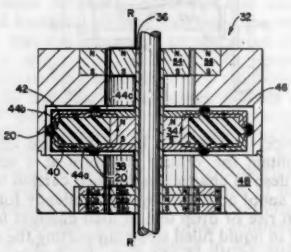
A support means has bearing means carried therein for movably supporting a movable member such as a shaft. Lubricating means is disposed within a recess in the support means in surrounding relationship to the movable member. This lubricating means defines a space therewithin having wick means and a lubricating substance disposed in such space. Outlet means is provided in the body means for dispensing the lubricating substance for lubricating the bearing means.

3,612,630

BEARING ARRANGEMENT WITH MAGNETIC FLUID DEFINING BEARING PADS

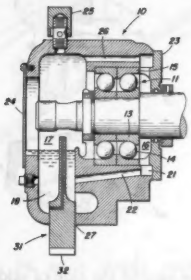
Ronald E. Rosensweig, Lexington, Mass., assignor to Ferrofluidics Corporation, Burlington, Mass.

Filed Jan. 23, 1970, Ser. No. 5,167
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 **18 Claims**



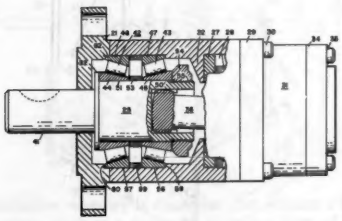
A bearing wherein a fluid bearing pad is sealed between two bearing surfaces, such as between an inner race and an outer race. A permanent magnet and permeable pole pieces define a magnetic circuit which circuit provides for the flow of magnetic flux across at least one of the bearing surfaces. A magnetic gap on the bearing surface through which the magnetic flux flows defines a predetermined continuous peripheral pattern. The magnetic flux is concentrated at the gap and a magnetic fluid is captured therein. The other bearing surface engages the magnetic fluid in sealing relationship and the fluid-bearing pad is sealed between the bearing surfaces and within the periphery defined by the magnetic fluid seal.

3,612,631
OIL MIST LUBRICATION
Ward F. O'Connor, Denville, N.J., assignor to The Lummus Company, Bloomfield, N.J.
Filed May 28, 1970, Ser. No. 41,393
Int. Cl. F16c *3/14*; F16C *33/66*
U.S. Cl. 308—78 7 Claims



Lubrication of bearings by the placing of a sonic generator in a bearing housing to provide a continuous mist or fog of oil within the housing to lubricate the bearings.

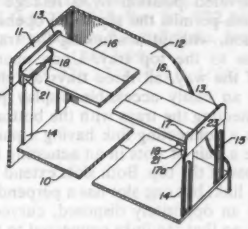
3,612,632
SPLIT-BORE MOUNTING FOR BEARING MEANS
George V. Woodling, 22077 W. Lake Road, Rocky River, Ohio
Filed Nov., 1969, Ser. No. 878,745
Int. Cl. F16c *35/06*
U.S. Cl. 308—207 8 Claims



A tapered roller bearing unit is split mounted in confronting bores provided in a pair of connected body members. The tapered roller bearing unit includes an outer cup mounted in split-bores confronting each other and adapted to make a close fitting relationship therewith. The close fitting relationship holds the split confronting bores in substantially straight axial alignment with each other, and in addition thereto, provides a fluid seal between the connected body members. Axial fixation means is provided to accommodate for the axial position of the bearing unit in the split-bores.

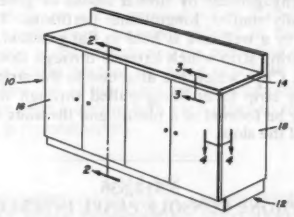
3,612,633
SHELF SUPPORT KIT
Charles C. Bloom, 919 Patten Drive, Palatine, Ill.
Filed Aug. 1, 1969, Ser. No. 846,660
Int. Cl. A47b *67/02*; A47f *5/08*; A47b *88/00*
U.S. Cl. 312—245 2 Claims

A shelf support kit for the installation of shelves in any semienclosed area having two sidewalls and a bottom member, such as an alcove or closet. The bottom member, substantially perpendicular to both sidewalls, may be the flooring, or a previously installed shelf. Essentially an inverted "U", the shelf support provides a rigid shelf construction without requiring the use of tools and/or fasteners, and yet can be temporary if desired. The shelf and support can be



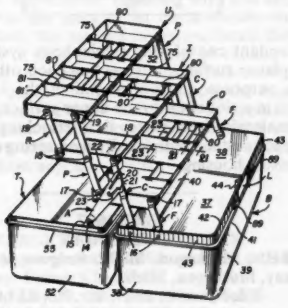
easily dismantled without danger of marring or otherwise disfiguring either the sidewalls or the bottom member.

3,612,634
CABINET CONSTRUCTION
Joseph S. Moore, Jr., Ackerman, Mass., assignor to U.S. Industries, Inc.
Filed Sept. 11, 1970, Ser. No. 71,475
Int. Cl. A47b *43/00*
U.S. Cl. 312—257 SK 10 Claims



A cabinet front assembly made of plastic or wood frame sections capable of being aligned and secured to each other without dowels to accommodate different installational requirements. Forwardly projecting flanges on parallel spaced toe plate and cleat are slidingly received in parallel grooves formed in the rear faces of bottom and top rails of one or more adjustably positioned frames having vertical side rails with aligned notches to receive shelf supports.

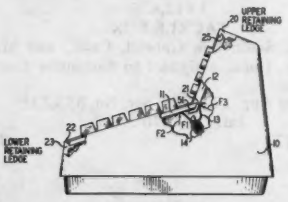
3,612,635
TACKLE BOX
Tim M. Uyeda, South San Gabriel, Calif., and Marvin M. King, Denver, Colo., assignors to Samsonite Corporation, Denver, Colo.
Filed Aug. 27, 1969, Ser. No. 853,335
Int. Cl. A47b *51/00*
U.S. Cl. 312—272 18 Claims



A spring urged device automatically opens the top, when the front latch is released from a pair of depending hooks

having multiple notches. The latch has slides, with a coil spring between for automatically latching, when the top is closed. A series of trays in normally stacked position are enclosed by the top, when closed. The trays are moved to a separated, elevated position by a linkage arrangement at each end which permits the top to be opened to a generally upright position, without unstacking the trays, thereby permitting access to the top tray. Upon opening the lid the remainder of the way, all three trays are automatically unstacked into an easily accessible display position. Parallel links for connecting the trays with the bottom and with each other include a connecting link having a pair of spaced pins which engage a pair of slots in an actuating link pivoted to a depending boss of the top. Both slots extend longitudinally of the actuating link, but one slot has a perpendicular portion at one end and an oppositely disposed, curved portion at the opposite end, so that the links connected to the trays will not be moved until the top is moved from upright to rear position. The top and bottom shells have lateral outside reinforcing ribs, that of the lower shell being spaced from the upper edge by an upright flange to which the latch is attached. The detent is mounted inside the front of the upper shell, while a pair of latching hooks are connected by a base embedded in the upper shell. The trays have reinforcing flanges around the upper edges, with notches on the outside engaged by an inside projection of a hook of a lateral partition, which hook is wider than the reinforcing flange which extends around the web of the partition. The top reinforcing flange is formed in a zigzag manner, to provide notches or serrations on opposite sides, for engagement by similar hooks of generally shorter and generally similar, longitudinal partitions. The handle is positioned in a well and is held in flat position, until pulled up, by a spring strip which extends through slots in the ends of the well. Clips which are attached to the strip prevent the ends of the strip from being pulled through the slots. The handle may be formed of a plastic and the ends of the handle used to seal the slots.

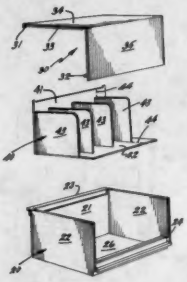
3,612,636
TELEPHONE CONSOLE PANEL INTERLOCKING DEVICE
Robert E. Bearse, New York, N.Y., and Richard Hollerith, Upper Montclair, N.J., assignors to Western Electric Company, Incorporated, New York, N.Y., by said Bearse and Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J., by said Hollerith
Filed June 9, 1969, Ser. No. 831,370
Int. Cl. A47b *81/00*
U.S. Cl. 312—283 **6 Claims**



An attendant console for a telephone system having two inclined planar surfaces intersecting each other wherein, for retention purposes, the upper end of the lower surface is positioned in a slot cut into the upper surface. Pressure, sufficient to maintain the surfaces in interlocking position, is applied to each surface individually by a spring device mounted to the console housing.

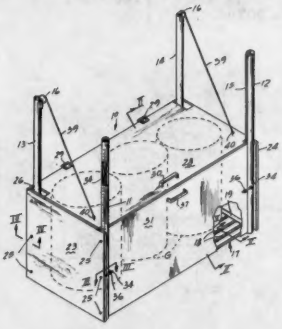
3,612,637
PAPER TRAY
Paul J. Betts, Muskegon, Mich., assignor to Browne-Morse Company, Muskegon, Mich.
Filed June 6, 1969, Ser. No. 831,071
Int. Cl. A47b *81/00*; **B65d** *25/06*
U.S. Cl. 312—290 **13 Claims**

A filing tray for use in a file drawer, being removable therefrom, having ends, a side panel, a bottom, and having a detachable cover which can be placed thereon for storing purposes. A paper hopper for use in said tray, being removable therefrom, having a side, a bottom, partitions, and a breakaway line; said hopper capable of being oriented in said



tray with its side against the side of said tray, with its side opposite the side of said tray or, with a portion thereof being broken off at said breakaway line, with its side generally parallel to the ends of said tray.

3,612,638
SANITARY GARBAGE CAN CABINET
James Francis Healy, 4925 Thomas St., Chicago, Ill.
Filed Nov. 13, 1969, Ser. No. 876,339
Int. Cl. E06b *9/14*
U.S. Cl. 312—319 **5 Claims**

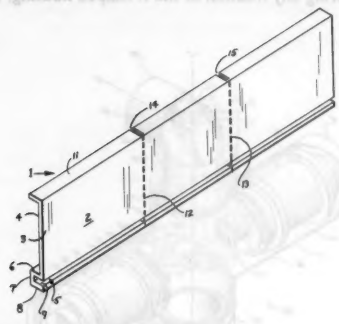


A box or cabinet for housing a plurality of garbage cans which has a counterbalanced lid giving easy access to the tops of the garbage cans and an open front closed by a balanced, vertically shiftable door for easy removal of the cans. The cabinet has four upstanding posts at the corners thereof supporting the walls and projecting above the lid to support counterweights or balancing means for the lid and door.

3,612,639
DRAWER
Cole C. Williams, 2408 Allanjay Place, Glendale, Calif.
Filed Dec. 23, 1968, Ser. No. 785,916
Int. Cl. A47b *88/00*, *43/00*
U.S. Cl. 312—330 **7 Claims**

A drawer formed of a thermoplastic panel with a vertical wall having flexible vertical hinge portions integral with an inner surface of the wall, which panel forms a back and two sides of a drawer which are held in a rectangular shape by a rigid rectangular bottom. The sides have resilient lock means joining the sides to a wooden front panel of the drawer. The drawer can be shipped flat, assembled, used, and then disassembled for again shipping the drawer components flat.

Finally, the drawer can be reassembled and used again. Since the drawer does not require glue to hold it together, the thermoplastic panel can be of a sturdy material, such as polypropylene, that provides a surface of high lubricity for sliding in a cabinet, but which material is not readily gluable.

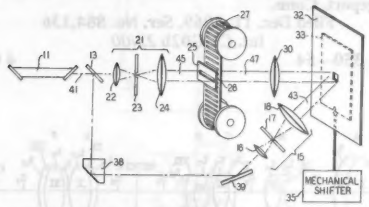


3,612,640

HOLOGRAPHIC TELEPHONE DIRECTORY WITH CINEMATOGRAPHIC ACCESSION OF INFORMATION

Herwig W. Kogelnik, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Sept. 23, 1969, Ser. No. 860,261
Int. Cl. G02b *27/00*; G03b *23/12*
U.S. Cl. 350—3.5 **3 Claims**



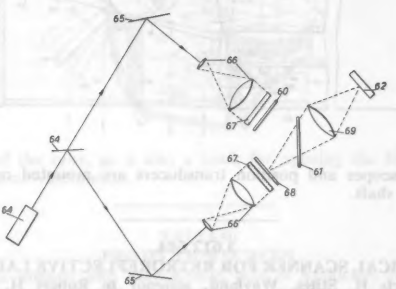
An associative memory is disclosed that relates a first item of information, such as a name, to a second item of information, such as a telephone number. First, each unit of information, which comprises two sets of symbols constituting a first item of information and its associated second item of information, is arranged in sequence according to a place, or positional, order. In such an order, all units of information that have identical symbols at a first position within each first item of information are arranged consecutively and the units within each such consecutive arrangement are similarly order by the symbols at a second position and so on. The Fourier transforms of each unit of information in the sequence are then formed individually; and a hologram of each transform is recorded in sequence on a photosensitive medium. When this information is viewed by illuminating a single hologram in the set of ordered Fourier transform holograms and moving a sequence of such holograms through the illuminating beam, only the identical symbols in the ordered items of information will be clearly seen. Thus, in the example above, if the names are stored in alphabetic order on the holograms, when the holograms are moved rapidly, only the first few letters of the recorded names will remain constant enough to be viewable; but when the holograms are moved slowly, most, or all, the letters of the names will be viewable. So by gradually slowing the speed of the holograms moving through the illuminating beam, it is possible to work through a large number of holograms to find the particular set of symbols, such as a telephone number, that is associated with a particular set of ordered symbols, such as a name.

3,612,641

HOLOGRAPHIC DATA STORAGE WITH AN ORTHOGONALLY CODED REFERENCE BEAM

Charles Cecil Eaglesfield, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 29, 1969, Ser. No. 872,261
Claims priority, application Great Britain, Jan. 23, 1969, 3812/69
Int. Cl. G02b *27/00*; G11c *11/42*
U.S. Cl. 350—3.5 **3 Claims**



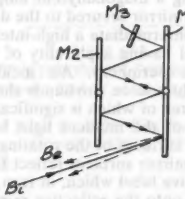
A system for holographic data storage in which a large number of holograms are superimposed on a single plate by an array of electro-optic elements placed in the reference beam. The array is operated during the recording of the holograms of data 'pages' so that the array is able to reconstruct an image of any one of the pages and the component images of every other page interfere with each other so that only the desired page is reconstructed.

3,612,642

A HIGH-VELOCITY OPTICAL SCANNER INCLUDING A TORSIONAL FORK SUPPORTING TWO REFLECTORS

Frank Dostal, Elmhurst, Long Island, N.Y., assignor to Bulova Watch Company, Inc., New York, N.Y.

Filed June 27, 1969, Ser. No. 837,013
Int. Cl. G02b *17/06*; H01s *3/11*
U.S. Cl. 350—6 **6 Claims**



A high-velocity optical scanner for laser "Q" switching and other purposes, the scanner including first and second mirrors mounted on the tines of an electronically driven torsional tuning fork, the mirrors being oscillated thereby. An incoming beam of light or other form of radiant energy is directed toward the first mirror which reflects it onto the second mirror, the second mirror directing the beam onto a fixed third mirror. The third mirror acts to duplex the beam by directing it back to the second mirror, which returns the beam to the first mirror, whose reflection produces an exit beam having a high angular velocity.

3,612,643

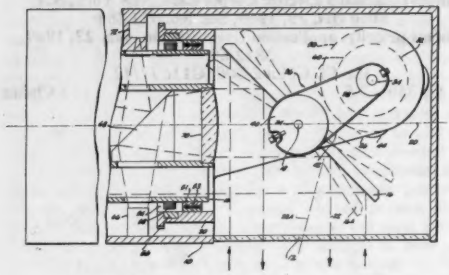
TARGET LOCATING SYSTEM

Morris Weber, Sherman Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed July 24, 1969, Ser. No. 844,358
Int. Cl. G02b *17/00*
U.S. Cl. 350—6 **3 Claims**

A receiving system including a mirror mounted on a pair of gimbals to direct light to a stationary detector, wherein the

inner gimbal is driven from a drive shaft which rotates at twice the speed as the mirror and in the same direction.



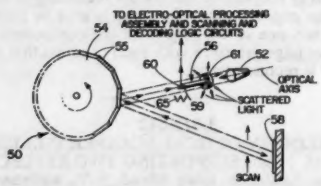
Gyroscopes and position transducers are mounted on the drive shaft.

3,612,644

OPTICAL SCANNER FOR RETROREFLECTIVE LABELS

Francis H. Stites, Wayland, assignor to Robert H. Reif, Groton, both of, Mass. and Sylvania Electric Products, Inc.

Filed July 6, 1970, Ser. No. 52,302
Int. Cl. G02b *17/08*
U.S. Cl. 350—7 **5 Claims**



An optical scanning apparatus for scanning a retroreflective label affixed to an object such as a vehicle. An elongated cylindrical rod having a diagonally cut elliptical end region and a small elliptical mirror secured to the diagonally cut end region is positioned intermediate a high-intensity light source and a rotating wheel having a plurality of reflective mirror surfaces around its periphery. An incident light beam produced by the light source surrounds the cylindrical rod, the cross-sectional area of which is significantly less than the cross-sectional area of the incident light beam, and strikes the reflective mirror surfaces of the rotating wheel in succession. The reflective mirror surfaces reflect the incident beam onto the retroreflective label which, in turn, retroreflects the incident beam back onto the reflective mirror surfaces. The reflective mirror surfaces then reflect the retroreflected beam toward the small elliptical mirror and a portion of the beam, constituting the most intense and desirable portion of the beam, is reflected by the small elliptical mirror to an electrooptical processing arrangement for further processing.

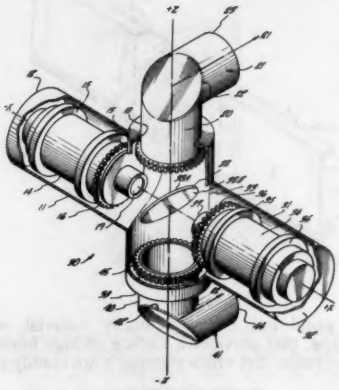
3,612,645

OPTICAL BINOCULAR SCANNING APPARATUS

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Gary L. Parker, La Cananda, Calif., and Frederick R. Chamberlain, La Cananda, Calif.

Filed Sept. 9, 1969, Ser. No. 856,328
Int. Cl. G02b *23/02*
U.S. Cl. 350—23 **13 Claims**

An optical scanner is disclosed comprising a linear housing having an optical instrument such as a camera rotatably mounted therein. A first mirror is fixedly mounted in the housing at the optical end of the image sensor at a 45° angle to the image plane thereof. An L-shaped housing is provided having one end rotatably mounted on the linear housing with the one end being in optical communication with the optical instrument by reflection from the first mirror. A second mirror is mounted at the corner of the L-shaped housing for redirecting the optical path out through the other end thereof. During any rotation of the L-shaped housing, the optical instrument is counterrotated to compensate for the image rotation on the first mirror so that, for example on a television monitor, the picture transmitted by the optical instrument would be always upright.

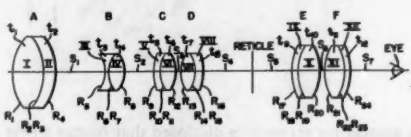


3,612,646

RIFLE TELESCOPIC GUN SIGHT

Merle H. Walker, Mohawk, and Lawrence S. Burrows, Utica, both of N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Dec. 11, 1969, Ser. No. 884,136
Int. Cl. G02b *23/00*
U.S. Cl. 350—54 **4 Claims**



The present invention relates to an optical system for telescopes and more particularly it relates to optical improvements in a rifle telescope incorporating a telephoto lens arrangement which has been used to compact the scope and provide a widened field of view. The telescope has been carefully designed to be visibly free of aberrations usually concomitant with telephoto systems. A negative power two-element component has been introduced into the scope as part of the objective lens arrangement. This insertion serves to produce the telephoto effect. The selection of the optical parameters, including lens element radii, thicknesses, airspaces, and optical glass, has been made to insure an optical system whose performance is equal or better than existing rifle telescopes, but which has reduced size and weight.

3,612,647

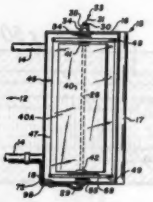
REAR VIEW MIRROR IN ROTATABLY WIPED ENCLOSURE

Ernest J. Laprairie, Suite 2, 4907 8th Street, S. W., Calgary, Alberta, Canada

Filed May 11, 1970, Ser. No. 36,013
Int. Cl. B60s *1/44, 1/60;* G02b *7/18*
U.S. Cl. 350—61 **6 Claims**

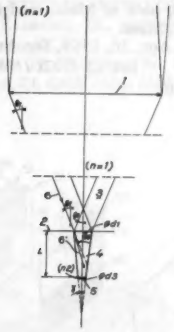
A vehicle rear vision mirror is enclosed in a protective case which is partially enclosed in a housing, the housing support-

ing the case for rotation about the mirror. The housing also supports a wiper blade in contact with a transparent window



of the case and a motor is provided to rotate the case and wipe the window across the blade.

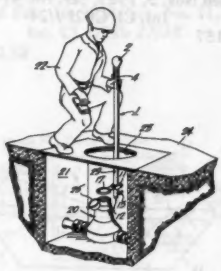
3,612,648
OPTICAL CONCENTRATOR WITH MAXIMUM ILLUMINATION
Pierre Malifaud, 95 boulevard Jourdan, Paris, 14e, France
Filed June 12, 1969, Ser. No. 832,666
Claims priority, application France, June 12, 1968, 154,663
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 R **2 Claims**



The radiation concentrator disclosed comprises a frustoconical mirror, or equivalent such as a bundle of tapered optical fibers, which concentrates flux from a frontal concentrator system onto a sensor. The dimensions of the mirror or equivalent are calculated by formulae which maximize the illumination of the sensor while accepting a preselected flux loss.

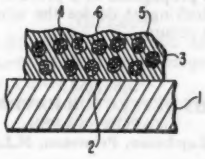
3,612,649
TOOL FOR READING UNDERGROUND METERS
Donald M. Pusey, Linwood, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
Filed Mar. 18, 1970, Ser. No. 20,523
Int. Cl. G02b *27/02*
U.S. Cl. 350—115 **7 Claims**

A portable tool for facilitating the reading from the surface of meters located underground, such as watermeters, utilizing an elongated tube containing water. This tube has a valve at one end and a squeeze bulb at the opposite end. When being used, the valve is at the lower end of the tube and the bulb at the upper end. A magnifying glass is mounted at the lower



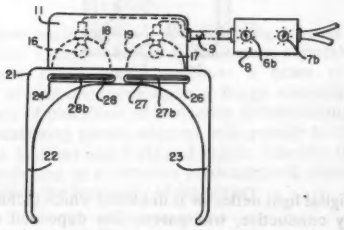
end of the tube, as is also a hook for opening the hinged covers of watermeters.

3,612,650
PROJECTION SCREEN
Shizuo Miyano, and Asaji Kondo, both of Asaka-shi, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Sept. 4, 1969, Ser. No. 855,174
Claims priority, application Japan, Sept. 4, 1968, 43/63487
Int. Cl. G03b *21/60*
U.S. Cl. 350—126 **13 Claims**



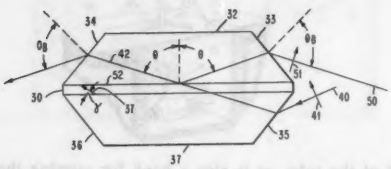
A reflection-type projection screen comprising a support, the surface of which has a metallic luster, having coated thereon a light scattering layer comprising oil-containing microcapsules and a binder.

3,612,651
SOUND SYNCHRONOUS OPTICAL VIEWER
Lawrence E. McCurdy, 224 W. 13th St., Apt. 3R, New York, N.Y.
Filed June 16, 1970, Ser. No. 46,789
Int. Cl. G02b *27/02*
U.S. Cl. 350—145 **7 Claims**



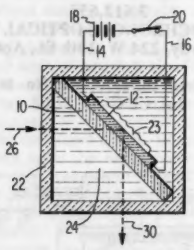
A music-enhancing optical viewer shaped and worn like ordinary eyeglasses or goggles has a separate light source for each lens, the illumination of which is respectively controlled by the instantaneous output voltages from the respective channels of a stereo music source so that the light produced by each source varies with the associated sound channel output. Parti-colored filter means between each light source and the wearer's eye, different for each eye, cause varied color effects to be produced which are related to music produced by the stereo music source.

3,612,652
NONRECIPROCAL OPTICAL DEVICE
Millard A. Habegger, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 5, 1969, Ser. No. 874,174
Int. Cl. G02f 1/24
U.S. Cl. 350—157 6 Claims



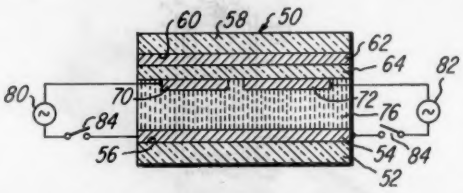
An optical device having the property that if a light beam is propagated at it in one direction the light beam is totally reflected and if the light beam is propagated at it in the reverse direction it is totally transmitted. A birefringent device has its optical axis in a predetermined direction with respect to the location of incidence of a light beam on it. The birefringent device is disposed in a suitable medium having an index of refraction which is substantially the same as the higher index of refraction of the birefringent device. When the light beam is propagated at a predetermined angle with respect to the birefringent device the nonreciprocal operation of the device occurs.

3,612,653
DIGITAL LIGHT DEFLECTOR HAVING LIQUID AND VAPOR STATES
Jan Aleksander Rajchman, Princeton, N.J., assignor to RCA Corporation
Filed Jan. 20, 1970, Ser. No. 4,304
Int. Cl. G02f 1/34
U.S. Cl. 350—160 6 Claims



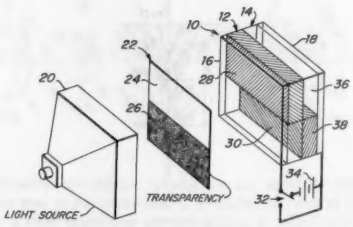
A digital light deflector is disclosed which includes an electrically conductive, transparent film deposited on a transparent substrate. The transparent film is made very thin so that it has a resistance to the flow of electric current and acts as a heating element. The transparent film is immersed in a transparent liquid in a transparent container. Light is directed through the container to the film at an angle therewith. The light normally continues in a straight line through the film, the liquid and out from one side of the container. When an electric current is applied to the film, heat is generated which vaporizes the liquid at the surface of the film and causes the light to be reflected by the film-vapor interface and pass out through a different side of the container.

3,612,654
LIQUID CRYSTAL DISPLAY DEVICE
Richard Ira Klein, Edison, and Sandor Caplan, Trenton, both of N.J., assignors to RCA Corporation
Filed May 27, 1970, Ser. No. 40,788
Int. Cl. G02f 1/28
U.S. Cl. 350—160 R 7 Claims



The device comprises a front transparent substrate having a transparent electrode on the inner surface thereof, a rear substrate, and a liquid crystal material disposed between the two substrates. The inside surface of the rear substrate is covered with a light-reflecting material, e.g., silver, covered in turn with a thin layer of dielectric material, e.g., silicon dioxide. Disposed on the dielectric layer is a patterned electrode of either a transparent material, e.g., tin oxide, or a light-reflecting material, e.g., silver.

3,612,655
FABRY-PEROT FILTER CONTAINING A PHOTOCONDUCTOR AND AN ELECTRO-OPTIC MEDIUM FOR RECORDING SPATIALLY VARYING INFORMATION
William Raymond Buchan, Lincoln, and Ralph Edward Aldrich, Woburn, both of Mass., assignors to Itek Corporation, Lexington, Mass.
Filed Apr. 30, 1969, Ser. No. 820,417
Int. Cl. G02f 1/38
U.S. Cl. 350—160 15 Claims

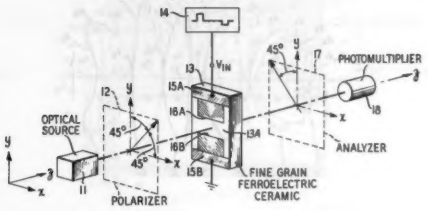


An electro-optic filter is disclosed having a Fabry-Perot structure including an electro-optic medium whose index of refraction varies as a function of the intensity of an electric field applied to it, means for applying an electric field to the medium, and means for varying the intensity of the electric field to shift the spectral response characteristic and optimum transmissivity range of the structure.

3,612,656
FINE GRAIN POLYCRYSTALLINE FERROELECTRIC CERAMIC OPTICAL SHUTTER
Juan R. Maldonado, North Plainfield, and Allen H. Meitzler, Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed June 23, 1969, Ser. No. 835,687
Int. Cl. G02f 3/00
U.S. Cl. 350—150 8 Claims

A fine grain polycrystalline ceramic, such as lanthanum doped lead zirconate-lead titanate, is used in a "latching"

optical shutter ("light gate"). The electric polarization of such a ceramic has been discovered to be amenable to a simple switching cycle, that is, the ceramic can be switched from a state of prescribed remanent polarization such as saturated polarization to a state of zero remanent polarization by means of a single applied voltage pulse. With this type of switching, optical shutters (of the latch relay type) can easily and simply be constructed, since the birefringence of the ferroelectric ceramic depends upon the simply switchable electric polarization thereof.

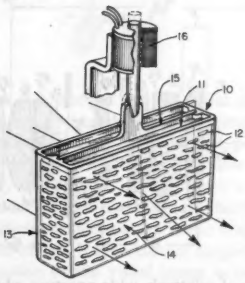


3,612,657

LIGHT-INTENSITY CONTROL DEVICE UTILIZING ORIENTED PARTICLES SUSPENDED IN A GEL

Samuel P. Sawyer, Evanston, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed June 22, 1970, Ser. No. 48,238
Int. Cl. G02f *1/34, 1/36*
U.S. Cl. 350—161 **6 Claims**



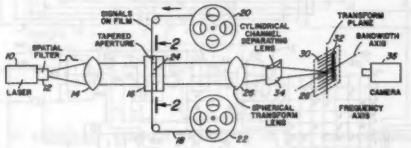
An adjustable light-intensity control device utilizes small, essentially flat particles oriented about parallel axes in the general direction of the light to be controlled and which are suspended in a clear loose gel in a suitable light-transmissive container. The light transmissivity of the device is changed by means of a "venetian blind" effect, with the container being provided with a partition which is moved in a direction transverse to the particle orientation so that the gel may be deformed to present an increasing fraction of the particle cross section to light rays which otherwise would pass through the device unobstructed. A servomechanism may be attached to the partition to make possible such applications as a window automatically adjustably to provide a constant ambient light level.

3,612,658

SIGNAL ANALYZER HAVING VARYING BANDWIDTH RESOLUTION

Frank H. Slaymaker, Rochester, N.Y., assignor to General Dynamics Corporation

Filed Feb. 16, 1970, Ser. No. 11,711
Int. Cl. G02b *27/38*
U.S. Cl. 350—162 SF **12 Claims**



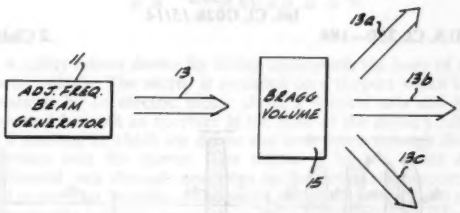
An optical analyzer is described in which a beam of monochromatic light is modulated by time-varying signals. The modulated beam then passes through a tapered aperture and is imaged in the Fourier transform plane by aspheric optics, such as a spherical and cylindrical lens having like focal lengths. The image displayed in the transform plane simultaneously shows the Fourier components of the signal and the instantaneous value of the time waveform. The frequency resolution varies continuously from one side of the display to the other.

3,612,659

PASSIVE BEAM-DEFLECTING APPARATUS

Robert L. Forward, Oxnard, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 9, 1969, Ser. No. 831,533
Int. Cl. G02b *5/18*
U.S. Cl. 350—162 R **14 Claims**



A passive beam deflector for deflecting a beam of electromagnetic energy wherein a frequency adjustable electromagnetic beam source produces a beam of energy directed at and impinging upon a Bragg scanning volume having sets of pluralities of frequency discriminating spaced parallel scattering planes oriented orthogonally to the bisector of the incident and deflected beams, whereby the beam will be deflected in a different predetermined direction depending upon the frequency of the energy.

3,612,660

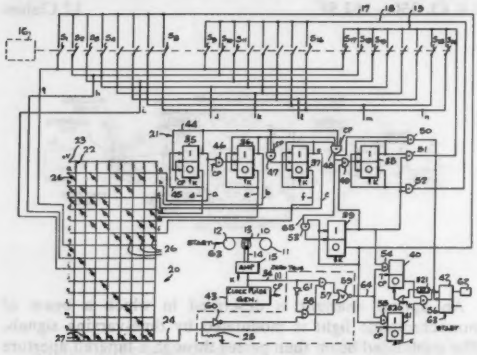
DIGITAL DATA COMPACTION

Wendell S. Miller, 1341 Comstock Ave., Los Angeles, Calif.

Filed Sept. 8, 1969, Ser. No. 855,973
Int. Cl. G06f *1/00*
U.S. Cl. 340—172.5 **30 Claims**

Data-processing equipment for writing a list of digital words, and then scanning the list to determine whether it includes a predetermined particular digital word, with the list

being compacted to occupy a reduced space or time by omitting some of the digits of some of the words in the list



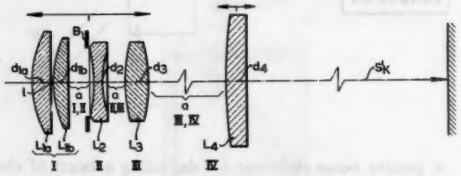
when those digits are identical with corresponding digits of other words in the list, or can be derived therefrom.

3,612,661

OBJECTIVE HAVING AT LEAST FOUR COMPONENTS SITUATED IN AIR AND HAVING AN APPROXIMATELY UNCHANGED HIGH IMAGE PERFORMANCE FOR LARGE CHANGES OF THE OBJECT-DISTANCES BETWEEN INFINITY AND A MAGNIFICATION OF CLOSE TO 1:1

Fritz Determann, Springkamp; Friedrich Uberhagen, Braunschweig, and Paul Schuhmann, Braunschweig, all of Germany, assignors to A. G. Voigtlander

Filed Feb. 20, 1969, Ser. No. 800,942
Claims priority, application Germany, Mar. 22, 1968, P 17 71 030.8
Int. Cl. G02b *15/14*
U.S. Cl. 350—184 2 Claims



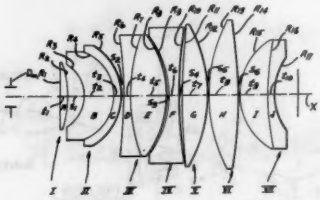
An objective of the expanded triplet type for photographing relatively distant as well as relatively close objects. Subsequent to the first three components in the direction from the longer to the shorter conjugate there is a fourth component of relatively weak refractive power which is less than one-third the equivalent refractive power of the entire objective. The length of the air space between the third and fourth components can be varied and this air space forms a converging air lens having a length smaller than 1.5 times the paraxial equivalent focal length of the entire objective. The first and second components define between themselves a diverging air lens having refractive power greater than one-fourth but smaller than the refractive power of the converging air lens between the third and fourth components. The refractive power of this latter air lens is greater than one-fourth but less than the lens refractive power of the second component which is a biconcave diverging lens.

3,612,662

EYEPIECE HAVING A WIDE FIELD OF VIEW AND A LARGE EYE RELIEF

Harold N. Sissel, Glendale, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed July 13, 1970, Ser. No. 54,301
Int. Cl. G02b *9/64*, *25/04*
U.S. Cl. 350—214 1 Claim



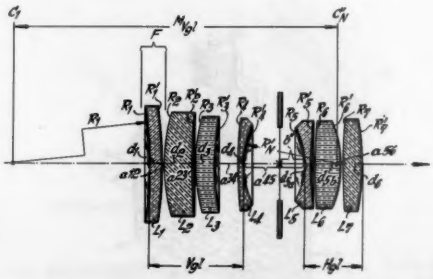
An eyepiece having a wide field of view and a large eye relief. The eyepiece is made up, going from the front to the rear, of a double convex singlet, a negative meniscus-shaped doublet concave to the front, a positive meniscus-shaped doublet concave to the front, a double concave singlet, two double convex singlets and a positive meniscus-shaped doublet convex to the front.

3,612,663

WIDE-APERTURE OBJECTIVE OF THE EXPANDED DOUBLE-ANASTIGMAT TYPE HAVING AN INNER BICONEX DIAPHRAGM-SPACE AND A CONCAVE FRONT SURFACE TOWARD THE DISTANT OBJECT

Albrecht W. Tronnier, Gottingen; Joachim Eggert, Braunschweig, and Fritz Uberhagen, Braunschweig, all of Germany, assignors to A.G. Voigtlander

Filed June 11, 1969, Ser. No. 832,301
Claims priority, application Switzerland, June 14, 1968, 8894/68
Int. Cl. G02b *9/62*, *9/64*, *27/14*
U.S. Cl. 350—214 6 Claims



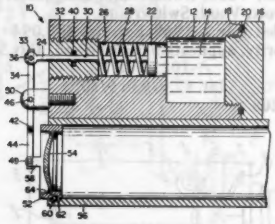
An objective of relatively wide aperture which is of the expanded double-anastigmat type and which has an inner diaphragm. The diaphragm is situated in an air space which defines the diaphragm chamber and which is of a dispersive configuration, this air space separating a forward component situated on the longer conjugate side of the air space from a rear component situated on the smaller conjugate side of the air space. The forward component terminates in opposite end surfaces both of which are concave so as to provide the forward component in its entirety with the configuration of a biconcave lens. The curvature of the concave front end surface of the component is determined by a radius the length of which is greater than two-thirds of the focal length of the objective without exceeding ten-thirds of this focal length calculated absolutely. This forwardly directed concave front end surface of the objective not only functions in a dispersive manner but also has an overcorrective action with respect to image errors.

3,612,664

OPTICAL PATH COMPENSATING DEVICE

Leon J. Berman, Culver City, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 14, 1970, Ser. No. 2,758
Int. Cl. G02b 7/24
U.S. Cl. 350—253 5 Claims



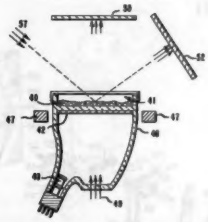
A device to compensate for changes in the length of an optical path due to ambient temperature variations. It employs a chamber, filled with temperature-responsive fluid, a moveable chamber wall, and linkage means connecting said wall to the lens mounts whereby changes in fluid volume adjust the length of the optical path.

3,612,665

METHOD AND APPARATUS FOR FORMING A VISUAL IMAGE OF A LATENT MAGNETIC IMAGE

Eustathios Vassiliou, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 9, 1969, Ser. No. 823,461
Int. Cl. G01r 33/02; G02f 1/30; G11b 11/10
U.S. Cl. 350—266 18 Claims



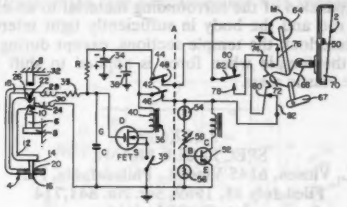
An apparatus and method for the visual observation of a latent magnetic image recorded on a magnetic member. The apparatus comprises: a nonmagnetic vessel, positioned above the magnetic member, having a broad shallow cavity containing magnetically active particles in a fluid or a vacuum; and a magnet to produce an external magnetic field. The magnetically active particles collect on the latent magnetic image to produce a visual image. If the external magnetic field is constant, the resolution of the visual image is increased. If the magnetic field is cycled between alternating polarity and is of sufficient intensity, the image reverses and the speed with which the visual image can follow changes in the latent magnetic image is increased.

3,612,666

ELECTRICALLY CONTROLLED REARVIEW MIRROR EMPLOYING SELF-CONTAINED POWER SUPPLY AND MOTION-ACTUATED POWER SWITCH

Jacob Rabinow, Bethesda, Md., assignor to Max L. Libman, Reston, Va., a part interest

Filed July 13, 1970, Ser. No. 54,474
Int. Cl. G02b 5/08, 5/10
U.S. Cl. 350—279 8 Claims



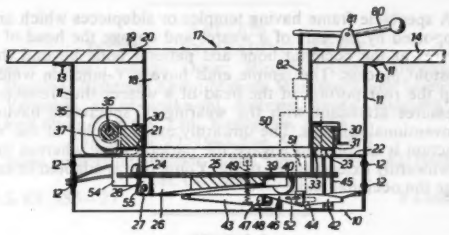
Photoelectrically controlled rearview mirrors for automobiles are old in the art and have been energized by the electrical system of the automobile. In order to eliminate wires, a rearview mirror is operated by its own small batteries and the circuit is arranged to have a very small standby current. In order to eliminate manual switching in one embodiment a trembler switch is employed. This switch operates whenever the car is in motion.

3,612,667

ROTATABLE AND RETRACTABLE SAFETY MIRROR FOR MOTOR VEHICLES

William John Austen Orr, Linden, The Ford, Donaghadee, County Down, Northern Ireland

Filed Apr. 7, 1970, Ser. No. 26,302
Int. Cl. G02b 5/08; B60r 1/06, 1/08
U.S. Cl. 350—289 9 Claims



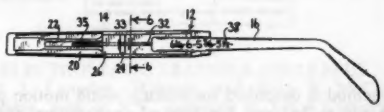
A safety mirror device for fitting underneath the body of a motor vehicle. The mirror is mounted on a support which is rotatable by an electric motor about a vertical axis and is mounted beneath an aperture in the floor of the driver's cab in a position in which the driver can look down through the aperture into the mirror. The mirror is hinged about a horizontal axis through one edge to the rotatable support, and is movable between a horizontal retracted position and a downwardly inclined operative position in which it enables the driver to view an area beneath the vehicle in successive directions through a 360° angular traverse as the mirror is rotated.

3,612,668

ADJUSTABLE TEMPLE FOR SPECTACLES

Willis T. Watkins, Hickman Mills, Mo., assignor to Parmelee Industries, Inc.

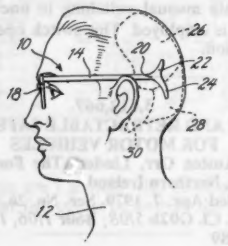
Filed May 4, 1970, Ser. No. 34,245
Int. Cl. G02c 5/20
U.S. Cl. 351—118 7 Claims



An extensible temple for spectacles utilizes a pair of relatively movable front and rear temple sections. The front tem-

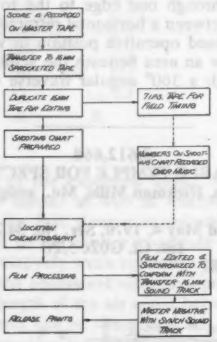
ple section receives a body of resilient material which presents an elastic mass through which an elongated connecting rod secured to the rear temple section passes. As the elongated connecting rod extends through the elastic mass it causes expansion of the surrounding material to an extent to hold the rod and the body in sufficiently tight interengagement to interlock the temple sections, except during adjustment of the temple when force is applied to shift the rod within the elastic mass.

3,612,669
SPECTACLE FRAME
William L. Vinson, 6145 Vine St., Philadelphia, Pa.
Filed July 15, 1969, Ser. No. 841,714
Int. Cl. G02c 5/14
U.S. Cl. 351—123 **1 Claim**



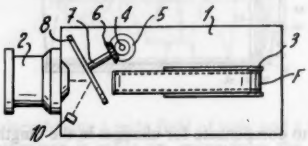
A spectacle frame having temples or sidepieces which are supported by the ears of a wearer and engage the head of a wearer at the occipital bone and parietal bone beyond the mastoid process. The temple ends have a Y-junction which grip the rear portion of the head of a wearer thus relieving pressures attendant with the wearing of spectacles having conventional temples. The upwardly extending leg of the Y-junction is adapted to engage the parietal bone whereas the downwardly extending leg of the Y-junction is adapted to engage the occipital bone.

3,612,670
METHOD OF PRODUCING EDUCATIONAL MOTION PICTURES
Donald R. Phillips, 1809 Mira Vista, Santa Barbara, Calif.
Filed Jan. 13, 1969, Ser. No. 790,571
Int. Cl. G03b 31/02
U.S. Cl. 352—5 **7 Claims**


SCORE IS RECORDED ON MASTER TAPE
TRANSFER TO FILM SPROCKETED TAPE
DUPLICATE FILM TAPE FOR EDITING
TAPE FOR FIELD TIMING
SHOOTING CHART PREPARED
NUMBERS ON SHOOTING CHART RECORDED ONTO MUSIC
LOCATION CINEMATOGRAPHY
FILM PROCESSING
FILM EDITED IS SYNCHRONIZED TO CONFORM WITH TRANSFER FILM SOUND TRACK
RELEASE PRINTS
MASTER MIXATAPE WITH SYNCH SOUND TRACK

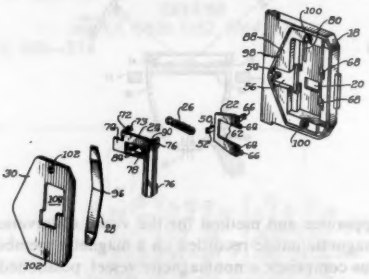
A method is described for making sound motion pictures which are to be used for musical appreciation and other musical education purposes. The film production is based on the matching of pictures to an unaltered musical composition. Various types of scene sequences are filmed and synchronized with certain sequences of bars of the music, having a certain instrumental sound. The method of the invention is aided by graphical techniques whereby the bars of the music having a (1) certain instrumental sound are keyed to a chart which lists time of music, (2) instrumental sound, (3) typical bar, and (4) typical frame.

3,612,671
CINEMATOGRAPHIC CAMERA
Henri Wermeille, Vaud, Switzerland, assignor to Paillard S. A., Sainte-Croix, Vaud, Switzerland
Filed July 1, 1969, Ser. No. 838,094
Claims priority, application Switzerland, July 9, 1968, 10222/68
Int. Cl. G03b 9/10
U.S. Cl. 352—208 **7 Claims**



In a cinematographic camera a shutter, formed by a sector with parallel faces, is interposable between an objective and a film, and is arranged to reflect rays over all its blanking zone to a photosensitive element. Means are provided for lowering the light flux transmission towards the photosensitive element in the normal rest position of the shutter.

3,612,672
APERTURE ASSEMBLY AND INTERMITTENT MECHANISM FOR A CAMERA
Richard K. Carlso, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Sept. 2, 1969, Ser. No. 854,486
Int. Cl. G03b 1/48
U.S. Cl. 352—221 **9 Claims**

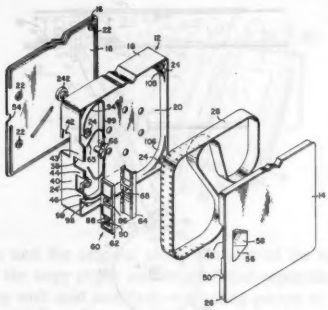


An assembly having an aperture plate as a portion of a housing enclosing spring tensioned side guides for films, a cam actuated shuttle member having an angularly shaped claw portion which advances a film frame by frame, a spring biases the claw portion into intimate contact with the film, yet permits the claw to cam out of the film perforation on its return, and a driven shutter rotated by a prime mover having a pin located eccentrically thereon for operating between lugs on the shuttle member to provide advance and return movements of the claw in proper timing sequence with an exposure sector of the shutter.

3,612,673
FILM ADVANCE MECHANISM
Ivars M. Skuja, Seattle, Wash., assignor to Audiscan, Inc., Bellevue, Wash.
Continuation of application Ser. No. 653,137, July 13, 1967, now abandoned. This application Jan. 9, 1970, Ser. No. 3,569
Int. Cl. G03b 1/48, 1/18
U.S. Cl. 352—225 **17 Claims**

A film advance mechanism of two sections. The two sections are provided with two adjacent inner surfaces that

guidingly advance film frame by frame, gate the film during advancement and mask the images for projection.. Cooperating teeth are provided on the inner surfaces to engage the



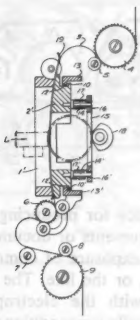
film sprocket holes of the film for advancing the film. The teeth extend into notches formed in the inner surfaces of the opposite sections.

3,612,674

IMAGE BLUR AND FILM DAMAGE PREVENTION DEVICE

Rikusaburo Sasaki, Hanno, Japan, assignor to Hiraoka Kogya Kabushiki Kaisha, Hanno City, Saitama Prefecture, Japan

Filed June 19, 1969, Ser. No. 834,849
Claims priority, application Japan, Nov. 21, 1968, 43/84867
Int. Cl. G03b *1/48*
U.S. Cl. 352—225 **1 Claim**



The present image blur prevention device is for use on a movie projector having a mechanism for intermittently feeding a film and has a film passage to be positioned across the light path of the projector, provided by a fixed film guide and a movable film guide with a cam operable in relation to said projector intermittent film-feeding mechanism to press said movable film guide against said fixed film guide during the intermittent pauses in the feeding of the film.

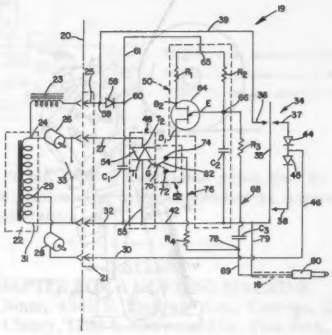
3,612,675

SYNCHRONIZING CIRCUIT

Joseph W. Ruta, Chicago, Ill., assignor to GAF Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 834,483, June 18, 1969. This application Dec. 10, 1969, Ser. No. 883,767
Int. Cl. G03b *31/00, 31/06*
U.S. Cl. 353—15 **9 Claims**

An electronic switch and a signal-producing circuit are provided in a system for synchronizing the operation of a slide projector with the operation of a tape recorder. The electronic switch and the signal-producing circuit are interconnected in such a way that when a single operating member is actuated for operating the system in a recording mode for synchronizing the recording of intelligence on one track of a tape with the slide changer of the slide projector, the signal-producing circuit will be energized to produce a stable control signal which is recorded on the same or another track of the tape simultaneously with triggering on of



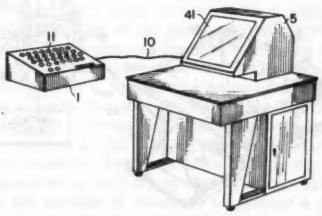
the electronic switch to energize a slide-changing device in the projector. The system also includes a normally closed circuit path between the electronic switch and the tape recorder for operating the system in a playback mode to change the slides in synchronization with the playback of intelligence from the tape.

3,612,676

DICTIONARY-READING DEVICE

Seiichi Ooba; Shingo Ooue; Hiroyuki Ueda; Masakazu Hashiue; Hirotoshi Endo; Makoto Murakoshi, and Masashi Yanagida, all of Asaka-shi, Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 22, 1968, Ser. No. 778,079
Claims priority, application Japan, Nov. 29, 1967, 42/76657
Int. Cl. G03b *23/08*
U.S. Cl. 353—27 **9 Claims**



A dictionary reader coupled with a key device having a set of keys corresponding to phonetic signs of the language used in the dictionary. By striking the keys in the order of a word, the page of the dictionary bearing the word is projected on a screen of the reader. The reader employs a microfilm projector when the film is driven so as to bring the image of the desired page on the film into alignment with the optical axis of the projector.

3,612,677

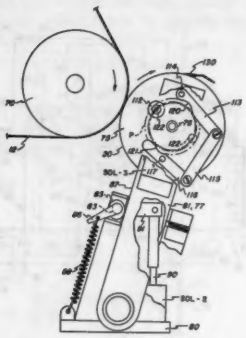
ELECTROSTATIC TRANSFER APPARATUS

Michael J. Langdon, Webster, and Alan F. McCarroll, Rochester, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 4, 1969, Ser. No. 830,381
Int. Cl. G03g *15/16*
U.S. Cl. 355—4 **5 Claims**

An electrically biased transfer drum for use as a transfer

mechanism in an electrostatic reproduction machine and having gripping devices for maintaining a sheet of paper on



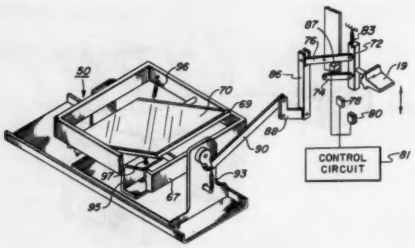
the drum during one or multiple transfer operations and other means for effecting stripout of the sheet.

3,612,678

APPARATUS FOR VIEWING AND REPRODUCING ENLARGED COPIES OF MICROFILM

Peter Haslam, Fairport; Alan G. Kendall, Rochester, and Anthony LaManna, Webster, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Feb. 3, 1969, Ser. No. 795,795
Int. Cl. G03g *15/04*
U.S. Cl. 355—5 **7 Claims**



An improved recording system for reproducing enlarged copies from microfilm on ordinary paper which utilizes a dual imaging optical apparatus to facilitate handling and viewing of microfilm to be reproduced. The apparatus includes a projection means for projecting light rays onto different imaging planes and a mirror mechanism adapted for pivotal movement on different axes to enable viewing and recording of the image.

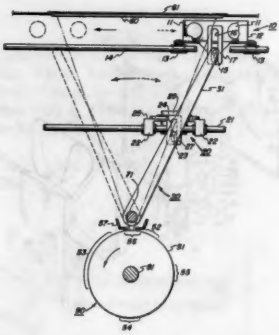
3,612,679

SCANNING APPARATUS

Frazer D. Punnett, Rochester, and Bion W. McClellen, Pittsford, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed May 2, 1969, Ser. No. 821,256
Int. Cl. G03g *15/04*
U.S. Cl. 355—8 **4 Claims**

A scanning device is herein disclosed for focusing a flowing light image of a stationary original upon a moving image-retaining member. The scanning components involved are positively driven through a single drive means and the motion



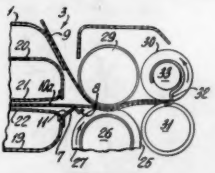
imparted thereto synchronized with the moving image-retaining member by a control means.

3,612,680

REFLEX TO DIRECT PHOTOCOPYING METHOD AND APPARATUS

F. Sutherland Macklem, New Canaan, Conn., assignor to Equipment Development Corp., New Canaan, Conn.

Filed Nov. 26, 1968, Ser. No. 779,057
Int. Cl. G03b *15/06*
U.S. Cl. 355—11 **6 Claims**



A method and device for producing electrophotographic copies of opaque documents or documents printed on both sides, through reflex exposure of commercial electrophotographic papers, films, or the like. The original document is placed face-to-face with the electrophotographic surface which has been especially preconditioned for reflex exposure by electrostatic charge limitation. The electrophotographic surface is exposed to a specially limited quantity of light directed through it to the face of the original document, the assembled pair being maintained in close contact during the exposure. Following exposure, an image is developed on the electrophotographic surface by electrostatic toning. The developed reflex image is a reversal of the original so that right-reading copies of the original are made from it by face-to-face reproduction means, such as by a direct exposure electrophotographic contact printing operation.

3,612,681

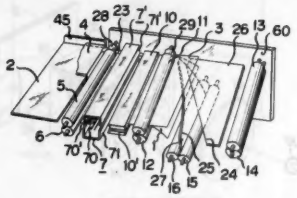
ELECTROPHOTOGRAPHIC COPYING DEVICE

Yoshio Itoh, Kokubunji-shi, Tokyo, Japan, assignor to Canon Kabushki Kaisha, Tokyo, Japan

Filed Apr. 16, 1969, Ser. No. 816,568
Claims priority, application Japan, Apr. 25, 1968, 43/27916
Int. Cl. G03g *15/22*
U.S. Cl. 355—12 **6 Claims**

The present invention provides an electrophotographic copying device of the type in which a copy paper is main-

tained in direct contact with an original to be copied. The device includes auxiliary separating means in the form of an elongated strip interposed between marginal portions of the



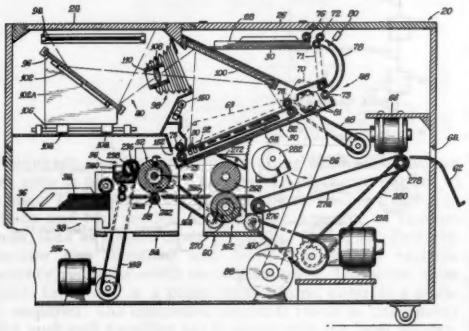
copy paper and the original along one side of the advancing passage of the copy paper and original and separating means cooperating with said auxiliary separating means to separate the copy paper from the original.

3,612,682

COPIER-DUPLICATOR MACHINE PROVIDING FOR PHOTOELECTROSTATIC MASTER FROM WHICH COPIES ARE MADE

Loren Sheiffo, Palatine, and Henry A. Mathisen, Northbrook, both of Ill., assignors to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

Filed June 7, 1968, Ser. No. 735,402
Int. Cl. G03g *15/22*
U.S. Cl. 355—14 **8 Claims**



A copier-duplicator includes a master-preparing section for uniformly charging and then exposing a photoelectrostatic master to provide a latent image on the master. An adjustable optical system permits the size of the image to be changed to provide copies of different sizes, and a controlled illumination source removes the charge from the unused area of the master to avoid spurious powder transfer to the copies. The prepared master is clamped on a rotating cylinder, and the image is developed by powder and transferred to copy sheets by a pressure roller as many times as required to produce the desired number of copies.

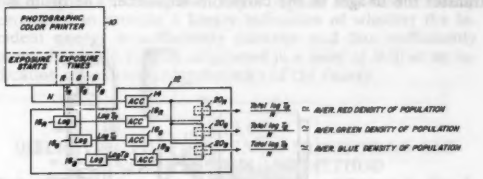
3,612,683

PHOTOGRAPHIC TIMING APPARATUS

Terry E. Riley, and Raymond G. Rogers, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 17, 1970, Ser. No. 47,068
Int. Cl. G03b *27/76*
U.S. Cl. 355—35 **8 Claims**

A device is disclosed for accumulating, for three primary colors, the log times required to print photographically a population of negatives, and to count the negatives in the population. Based on such accumulations, the average log times of the population may be determined; and from such



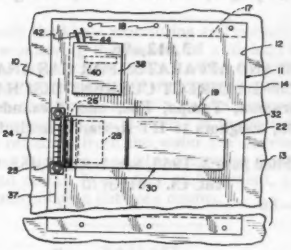
average log times, a setup calibration patch may be formulated for the printer. The device embodies an improved log time pulse generator.

3,612,684

ADAPTER FOR A COPYING MACHINE

William T. Jones, 4341 S. Emerald Ave., Chicago, Ill., and Joseph P. Clancy, 1155 S. Elmwood Ave., Oak Park, Ill.

Filed May 13, 1969, Ser. No. 824,109
Int. Cl. G03b *27/62*
U.S. Cl. 355—40 **9 Claims**



An adapter for use with a copying machine of known type includes a multilayer plate receivable in a window in the machine. A lower face of the plate has first markings visible therefrom which are directed toward the copying mechanism in the machine. The plate has an opening therein for inserting into the adapter a card having second markings thereon identifying a particular subject. Preferably, the adapter includes a door for covering the opening and a counter which presents a number to the copying mechanism during operation of the machine. The counter is operatively associated with the machine in such a way that after one set of copies are made, the counter is advanced to present a succeeding number to the copying mechanism before the next set of copies are made. With this adapter, each copy of a predetermined number of copies made by the machine will have the first and second markings thereon and, if desired, a serial number presented by the counter.

3,612,685

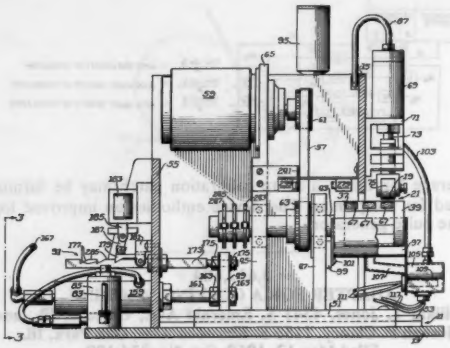
APPARATUS AND PROCESS FOR GRAPHIC-IMAGE TRANSFER

Len A. Tyler, Evanston, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 2, 1968, Ser. No. 695,228
Int. Cl. G03b *27/04*
U.S. Cl. 355—95 **14 Claims**

A process for transferring electrophotographically developed images from a web to a final image carrier utilizing pressure contact and a preconditioning treatment of the final image carrier by a tackifying fluid. Apparatus includes a drum for releasably clamping the final carrier thereon partially enclosed in a vapor chamber in which the carrier surface is preconditioned. A web having a transferable image

thereon is disposed in aligned contact with the drum and the web is transported and the drum is rotated by frictional driving contact with a reciprocable pressure roller thereby to transfer the images to the carrier in sequence. The drum is



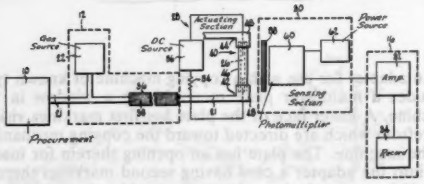
also axially indexable by an air-operated piston and controlled by a rack and solenoid-operated panel. An adjustable, automatic, continuous liquid-metering device measures the amount of tackifying liquid fed to the vaporizing chamber.

3,612,686

METHOD AND APPARATUS FOR GAS ANALYSIS UTILIZING A DIRECT CURRENT DISCHARGE

Robert S. Braman, Tampa, Fla., and Alexander Dynako, Chicago, Ill., assignors to IIT Research Institute, Chicago, Ill.

Filed Jan. 3, 1968, Ser. No. 695,455
Int. Cl. G01j *3/30*
U.S. Cl. 356—86 **15 Claims**



A method and apparatus for spectrochemical analysis of a gas is provided in which the subject gas is mixed with a carrier gas and introduced into an analysis space between two electrodes. A continuous direct current discharge between the electrodes is produced which sustains a plasma formed from the carrier gas so that components of the subject gas are excited to luminescence. Characteristic radiation emitted by the components is then detected. The carrier gas has a higher ionization potential than components of the subject gas and, for example, may be a noble gas. The method is operable at atmospheric pressure. The electrodes may be either solid wires or tubes through which the gas mixture enters and leaves the analysis space.

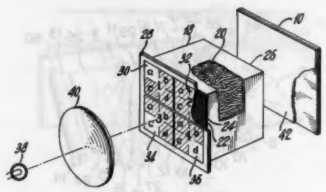
3,612,687

CREDIT CAR SYSTEM

Melvin S. Cook, Scarsdale, N.Y., and Edward M. Ulicki, East Paterson, N.J., assignors to Holobeam Inc., Paramus, N.J.

Filed July 17, 1968, Ser. No. 745,465
Int. Cl. G06k *9/08*; **G02b** *5/14*
U.S. Cl. 356—71 **11 Claims**

A credit card system is described wherein a credit card has an area thereof provided with a pattern representative of a code. A card pattern reader is provided wherein selected portions of the pattern are decoded for verification of the code represented by the pattern. The credit card system as



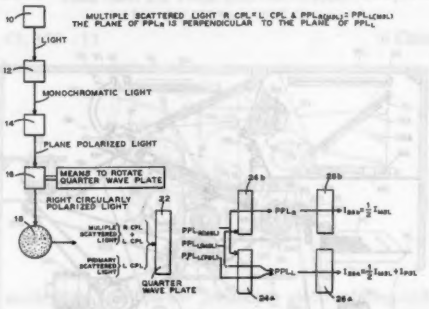
described provides a system secure from fraudulent credit card use.

3,612,688

SUSPENDED ORGANIC PARTICLES MONITOR USING CIRCULARLY POLARIZED LIGHT

John W. Liskowitz, Belle Meade, N.J., assignor to American Standard Inc., New York, N.Y.

Filed Nov. 13, 1968, Ser. No. 775,449
Int. Cl. G01n *15/02, 21/00, 21/40*
U.S. Cl. 356—102 **13 Claims**


MULTIPLE SCATTERED LIGHT R CPL + L CPL & PPL(MOBIL) ≥ PPL(LOBIL) THE PLANE OF PPLa IS PERPENDICULAR TO THE PLANE OF PPLb
LIGHT
MONOCHROMATIC LIGHT
PLANE POLARIZED LIGHT
MEANS TO ROTATE QUARTER WAVE PLATE
RIGHT CIRCULARLY POLARIZED LIGHT
QUARTER WAVE PLATE

Method for detecting optically active organic particles suspended in a fluid, including water, air or a vacuum, by measuring circular dichroic absorption. The method comprising the steps of alternately transmitting right circularly polarized light and left circularly polarized light through the fluid being analyzed whereby the circularly polarized light is scattered by the particulate matter in the sample. The scattered radiation is analyzed by separating the circularly polarized components in the resulting scattered light and measuring the intensity of the resulting scattered light components. The circular dichroic absorption in the scattered lights is represented by the ratio of the component intensity of when starting with right circularly polarized light to that of the intensity when starting with left circularly polarized light.

3,612,689

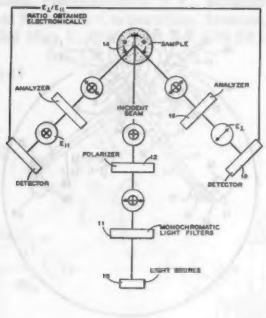
SUSPENDED PARTICLE CONCENTRATION DETERMINATION USING POLARIZED LIGHT

John W. Liskowitz, Belle Meade, N.J., assignor to American Standard Inc., New York, N.Y.

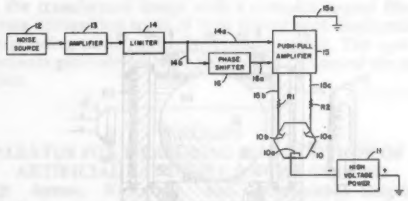
Continuation-in-part of application Ser. No. 629,568, Apr. 10, 1967. This application Nov. 12, 1968, Ser. No. 775,093
Int. Cl. G01n *21/00*
U.S. Cl. 356—103 **20 Claims**

Particles suspended in a fluid are detected by directing an incident beam of polarized light at the particles and deter-

mining the relationship between the depolarized and polarized components of the light which is scattered by the particles. The angle between the scattered light and the incident light is preferably greater than 150°.

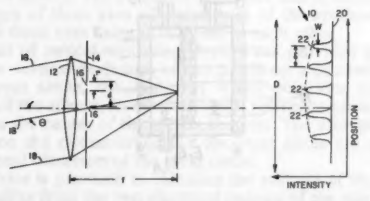


3,612,690
LASER GYRO DITHER CIRCUIT
Robert C. Staats, Fridley, Minn.
Filed July 8, 1970, Ser. No. 53,150
Int. Cl. G01b 9/02
U.S. Cl. 356—106 LR **3 Claims**



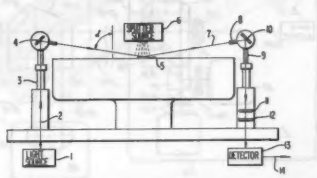
Frequency coupling of counterrotating beams in a gaseous laser gyro is prevented by varying the discharge current in the laser. The circuit is for use with a laser having a common cathode and two anodes, and includes a source of random signals, such as a noise diode generator. The signals from the generator are amplified and limited to give a variable frequency and pulse-width rectangular wave. This wave, in its original form, and in a phase-shifted form, controls a push-pull amplifier. The controlled elements (such as transistors) in the push-pull amplifier are in series with the laser anodes. Thus, a random rectangular wave is effectably applied to the discharge current through each anode.

3,612,691
MONOCHROMATICITY DETECTOR
Jacob Schwartz, Arlington, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed Feb. 7, 1969, Ser. No. 797,563
Int. Cl. G01b 9/02
U.S. Cl. 356—106 **15 Claims**



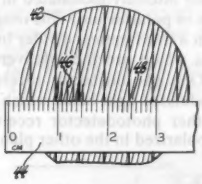
A monochromaticity detector is disclosed herein which comprises means for producing the diffraction or interference pattern of light received from a remote source and a reticle/detector array of a predetermined pattern. The spatial intensity pattern produced at the detectors is periodic if the incident light is monochromatic and nonperiodic for broadband light. The detector output signals are electronically processed to provide a binary indication of whether the incident energy is sufficiently periodic and thus sufficiently monochromatic to have originated in a laser as well as an indication of selected characteristics of the energy.

3,612,692
DIELECTRIC FILM THICKNESS MONITORING AND CONTROL SYSTEM AND METHOD
Robert W. Kruppa, Hopewell Junction, and Ernest S. Ward, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 21, 1968, Ser. No. 777,556
Int. Cl. G01b 9/02; G01r 21/40
U.S. Cl. 356—108 **9 Claims**



An automatic thickness monitoring and control system and method for monitoring the growth of a dielectric film on a reflective substrate such as a silicon wafer during an RF sputtering deposition process and for stopping the deposition process when the film reaches a predetermined thickness. The successive minima (or maxima) in the interference pattern of light reflected from the wafer are counted to determine the film thickness and the sputtering is stopped at a predetermined count. In another embodiment, sputtering is stopped by interpolation between counts.

3,612,693
METHOD FOR MEASUREMENT OF SURFACE PROFILE CHANGE USING A VERNIER SCALE IN HOLOGRAM INTERFEROMETRY
Karl A. Stetson, Richmond, Surrey, England, assignor to GC Optronics, Inc., Ann Arbor, Mich.
Filed May 15, 1970, Ser. No. 37,723
Int. Cl. G01b 9/02; G02b
U.S. Cl. 356—109 **5 Claims**



To measure the amount of surface profile change of an object, a hologram is formed by recording on a photographic media the interference pattern between coherent light divided between a uniform, reproducible wave front and mutually coherent light reflected from the object. The virtual image of the object as seen through the hologram formed by the developed photographic media, properly illuminated, is superimposed on the same object with the object being inclined with respect to the virtual image by a predetermined amount. The positions of the object and the virtual image are adjusted to result in the formation of fringes which are spaced apart from one another by a first predetermined scale length. Changes in the profile of a section of the object will result in a shifting of those fringes associated with the unchanged portion. The fringe shift may be measured by em-

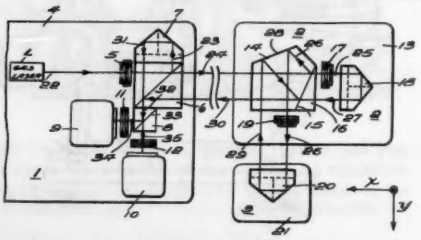
ploying a second scale having divisions which differ from those of the first scale, in the manner of a vernier scale, such fringe shift being a function of the surface profile change.

3,612,694

ARRANGEMENT FOR INTERFEROMETRIC MEASUREMENT OF TWO LENGTHS

Francois Mottier, and Friedrich Karl Von Willisen, both of Zurich, Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Dec. 23, 1968, Ser. No. 786,235
Claims priority, application Switzerland, Jan. 31, 1968, 1490/68
Int. Cl. G01b *9/02*
U.S. Cl. 356—110 **4 Claims**



An arrangement for simultaneous interferometric measurement of a plurality of lengths utilizes a single monochromatic circularly polarized light beam which is divided up by intensity in a first optical divider into an outgoing reference beam and an outgoing primary measuring beam. This measurement beam is then divided up by intensity in a second optical divider after traversing one of the lengths to be measured into a pair of outgoing secondary measurement beams which are then polarized in mutually perpendicular planes of polarization. One of these outgoing secondary measurement beams is reversed and returned to the second optical divider and the other outgoing secondary measurement beam is also similarly reversed and returned but after it has traversed the second length to be measured. The two returning secondary measurement beams are then recombined in the second optical divider and returned to the first optical divider where they are combined with the reference beam which has been reversed and returned thus to form an outgoing light beam which is differently intensity-modulated in two mutually perpendicular planes of polarization. This outgoing light beam is then divided up in a third optical divider into a pair of modulated light beams which are then delivered respectively to photodetectors. One photodetector receives only the component of the modulated light beam which is polarized in one plane and the other photodetector receives only the component which is polarized in the other plane.

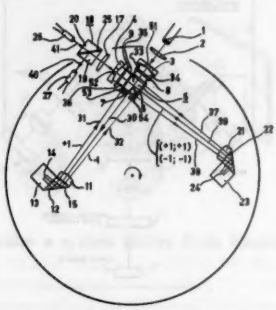
3,612,695

ARRANGEMENT FOR MEASURING THE ROTATION OF A FIRST OBJECT RELATIVE TO A SECOND OBJECT

Gijsbertus Bouwhuis, Emmasingel, Eindhoven, and Hendrik de Lang, Delft, both of Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Sept. 23, 1969, Ser. No. 860,208
Claims priority, application Netherlands, Sept. 26, 1968, 6813749
Int. Cl. G01b *11/00*
U.S. Cl. 356—114 **9 Claims**

An arrangement for measuring the rotation of a first object relative to a second object is disclosed. Light from a source of radiation attached to the first object is directed to a first zone on a grating attached to the second object, is then directed via polarization modulators and concave mirrors to a second zone on the grating and finally impinges upon a pair of photocells. The output of the photocells is processed to determine both the magnitude and direction of the relative rotation.

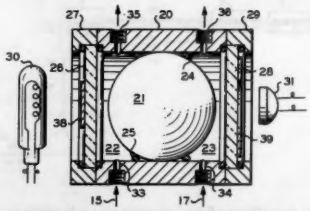


3,612,696

REFRACTOMETER

Arthur B. Broerman, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Jan. 21, 1969, Ser. No. 792,554
Int. Cl. G01n *21/46*
U.S. Cl. 356—128 **6 Claims**



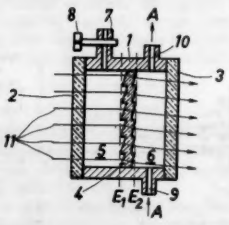
A refractometer cell comprises a housing forming a chamber through which radiation can be transmitted, said chamber being adapted to receive a test fluid. A radiation-transparent refracting means is positioned within the chamber. In one embodiment, this refractive means is a spherically shaped element. In another embodiment, the refractive means comprises two spaced elements having concave spherically shaped surfaces facing one another.

3,612,697

DIFFERENTIAL REFRACTOMETER CELL

Wolfgang Nebe, Jena, Germany, assignor to Jenoptik Jena GmbH, Jena, Germany

Filed June 6, 1969, Ser. No. 831,285
Claims priority, application Germany, Dec. 9, 1968, P 18 13 497.9
Int. Cl. G01n *21/46, 21/06, 1/10*
U.S. Cl. 356—130 **3 Claims**



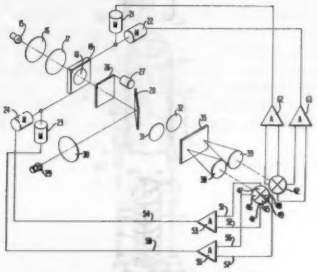
A differential cell includes at least one stepped partition. The partition wall is transparent, and the windows of the cell may be Fresnel lenses.

3,612,698

AUTOMATIC HOLOGRAPHIC WAFER POSITIONING SYSTEM AND METHOD

Einar S. Mathisen, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1969, Ser. No. 820,983
Int. Cl. G01b *11/26*
U.S. Cl. 356—141 9 Claims



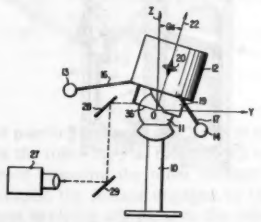
System and method for automatic alignment of workpieces such as semiconductor wafers and a photomask for subsequent image exposure. Alignment is based on the transparency of the wafers to infrared light and the opaqueness thereto of alignment patterns fabricated in the wafer. A holographic optical system generates a Fourier transformed image of light transmitted through the wafer and cross-correlates the transformed image with a complex spatial filter to generate recognition spots of light having spot displacements corresponding to the waferfilter nonalignment. The spot displacements generate an error signal used to control the wafer position.

3,612,699

APPARATUS FOR MEASURING THE ATTITUDE OF AN ARTIFICIAL SATELLITE ON THE GROUND

Kuniji Asano, Kawasaki, and Masamichi Shigehara, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 28, 1970, Ser. No. 41,448
Claims priority, application Japan, May 23, 1969, 44/41,347
Int. Cl. G01c *1/00*; B64c
U.S. Cl. 356—147 8 Claims



An upright stand has a sphere rotatably mounted on the top thereof. An artificial satellite is in turn mounted on the sphere such that its center of gravity coincides with the center of sphere. The center of the sphere also coincides with the origin of three axes of coordinates of the artificial satellite, the three axes being orthogonal to each other.

A pair of optical-measuring devices are provided to measure the vertical deviations of two points on a circumference of a great circle, the center of which coincides with the center of the sphere, from a horizontal reference plane which includes the center of the sphere thereon. The aforesaid two points on the circumference of the great circle are on two orthogonal diameters of the great circle.

A device is provided to calculate the attitude of the artificial satellite from the two electrical outputs of the pair of optical-measuring devices and an electrical reference input signal which represents the coordinates of the center of the great circle.

ERRATUM

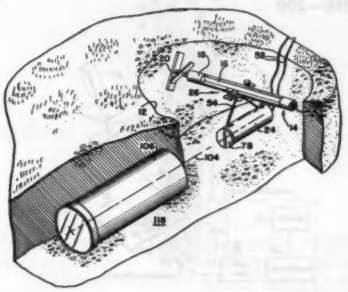
For Class 356—153 see:
Patent No. 3,612,949

3,612,700

LASER BEAM REFERENCE LINE MEANS AND METHOD

Rodney L. Nelson, Box N, R.D. #1, Falls Creek, Pa.

Filed Jan. 21, 1969, Ser. No. 792,290
Int. Cl. G01b *11/24*; G01c *15/00*
U.S. Cl. 356—153 18 Claims



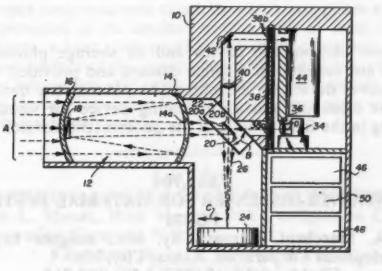
The invention comprises means and a method for establishing a reference line for construction purposes in the form of a energy beam or signal, such as a visible light beam, and preferably, a laser beam. The apparatus includes an energy beam source, adjustably mounted within a housing, pendulously suspended for movement within a vertical plane. The energy beam source and housing are stabilized with respect to a suspension point, so that the energy beam source and housing assume a stable, horizontal position. The apparatus further includes tridimensional adjustment mechanisms for the energy beam source and a stable support for the suspension point. The method of the invention includes the steps of establishing a line offset 90° to the reference line, placing the energy beam source approximately coincident to the reference line, adjusting the energy beam source vertically to coincide with the depth of the reference line, adjusting the energy beam source internally of its housing to desired grade, adjusting the energy beam source to coincide with the reference line in a horizontal plane, and interrupting the projection of the energy beam source to check true vertical plane alignment.

3,612,701

LIGHT-DETECTING SYSTEM

Irving Bleicher, Fairlawn, N.J., assignor to Singer-General Precision Inc., Little Falls, N.J.

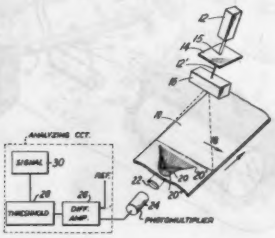
Filed Jan. 9, 1969, Ser. No. 790,004
Int. Cl. G01b *11/26*; G01j *1/20*
U.S. Cl. 356—172 2 Claims



A light-detecting system in which reflecting means are disposed in the path of the light to be detected in order to reflect the light onto a fixed sensing means responsive to the

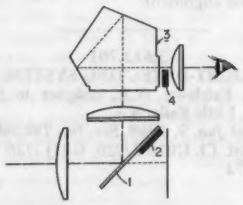
reflected light, for generating a corresponding output signal. Means are provided to impart motion to the reflecting means to move the reflected light in a fixed path across the sensing means.

3,612,702
WEB DEFECT DETERMINATION BY LASER BEAM IRRADIATION AND REFLECTED LIGHT EXAMINATION
John H. Troll, Ridgefield, Conn., assignor to Iris Corporation
Filed Sept. 9, 1969, Ser. No. 856,390
Int. Cl. G01n *21/32*
U.S. Cl. 356—200 **1 Claim**



A laser beam is caused to scan a moving web transversely of the web direction of motion at a predetermined rate, and the detected light accumulated from one linear scan. The accumulated light is analyzed by a photomultiplier feeding a comparator, for example a differential amplifier, having one of its inputs at a reference potential.

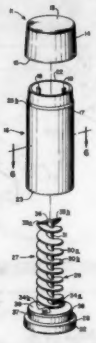
3,612,703
COMBINED SPOT AND AVERAGE PHOTOMETRIC SYSTEM
Kunio Irisawa, Tokyo-to, and Kazuo Saita, Kashiwa-shi, both of Japan, assignors to Mamiya Koki Kabushiki Kaisha, Bunkyo-ku, Tokyo-to, Japan
Filed Feb. 29, 1968, Ser. No. 709,257
Claims priority, application Japan, May 29, 1967, 42/33694
Int. Cl. G01j *1/42*
U.S. Cl. 356—219 **1 Claim**



A spot photometric device and an average photometric device are installed in a single camera and provided with a changeover device for switching one photometric device on and the other off and an indicating device for visually indicating in the finder which of the photometric devices is on.

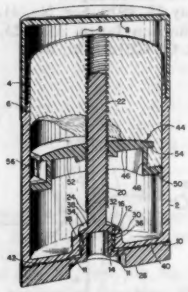
3,612,704
CONTAINER-DISPENSER FOR MATERIAL IN STICK FORM
Paul A. Marchant, Kansas City, Mo., assignor to Ethyl Development Corporation, Kansas City, Mo.
Filed Sept. 15, 1969, Ser. No. 857,765
Int. Cl. A45d *40/06*
U.S. Cl. 401—72 **10 Claims**

A simplified container-dispenser for material in stick form which includes a cap, a tubular body, and a feed screw assembly. The feed screw assembly comprises a knob and a screw, the screw being integrally molded with the knob and projecting into the stick. Upon rotation of the knob of the



feed screw assembly, the screw rotates to push the stick upwardly and out of the tubular body.

3,612,705
DISPENSING CONTAINER
Ernest H. Duval, Winthrop, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Sept. 3, 1969, Ser. No. 854,954
Int. Cl. A46d *40/06*
U.S. Cl. 401—75 **10 Claims**

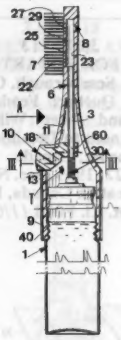


A dispensing container for cosmetics and toilet preparations of the type wherein the preparation is extruded in stick form under the influence of a screw-driven follower.

3,612,706
SELF-PROPELLED TOOTHBRUSH
Francesco Verga, Dr. Ing. Misitano A. G. Via Padova, 217-20127, Milan, Italy
Filed Jan. 3, 1969, Ser. No. 788,878
Claims priority, application Italy, May 24, 1968, 16862 A/68
Int. Cl. A46b *11/02*
U.S. Cl. 401—190 **3 Claims**

A toothpaste-dispensing toothbrush comprises an upper body carrying bristles and associated with a lateral pushbutton, and a lower body consisting of a container with a valve

and containing a toothpaste composition mixture. The combination is such that as soon as the pushbutton is depressed



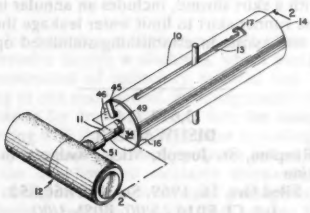
the valve is opened and an outflow of the toothpaste mixture through the bristles is allowed.

3,612,707

PAINT ROLLER FOR EDGING

Charles Herbrechter, Leetown Road, and Walter Pahlck, Hosner Mt. Road, both of Stormville, N.Y.

Filed Mar. 4, 1970, Ser. No. 16,461
Int. Cl. B44d *3/28*
U.S. Cl. 401—197 10 Claims



A roller for painting surfaces which are at an angle to each other wherein the roller may be rolled along one surface with one end thereof engaging the other surface and be guided thereby whereupon the surface engaged by the roller will be painted without applying any paint to the other surface. The roller may be used as a fountain roller or one to which paint is applied to the surface thereof.

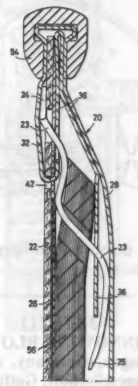
3,612,708

BOOK-TYPE FILE FOR PUNCHED PAPERS

Carl Erik Grundell, Osmogatan 8, Enskede, Sweden

Filed Apr. 23, 1970, Ser. No. 31,198
Int. Cl. B42f *13/06*
U.S. Cl. 402—8 7 Claims

A file for punched papers comprises a stiff back cover member and a pliant front cover member connected thereto by means of flap extensions threaded through slits in the back cover member. At least one flap extension of the front cover member also forms part of looseleaf binder inside the file in cooperation with flexible tongues onto which the punched papers to be filed are threaded. In a preferred form the two cover members are held together by a channel bar. In another form rivets or the like are used to hold together



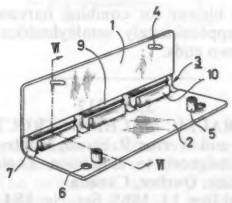
the two interconnected cover members. The file may be closed by snap fasteners.

3,612,709

LOOSELEAF BINDER

Eitaro Miyamoto, Tokyo, Japan, assignor to King Jim Co., Ltd., Tokyo, Japan

Filed June 3, 1969, Ser. No. 830,066
Claims priority, application Japan, Sept. 26, 1968, 43/69756
Int. Cl. B42f *3/02, 13/30*
U.S. Cl. 402—22 3 Claims



A looseleaf binder formed integrally of synthetic resin having proper toughness and elasticity which comprises a cover plate provided in its internal surface with at least two or more posts, a base plate provided on its inner surface facing the inner surface of the cover plate with at least two or more sockets into which said posts are fitted disengageably and a flexible connecting means for joining the cover plate with the base plate symmetrically.

3,612,710

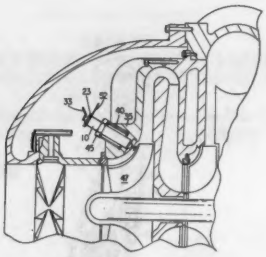
CENTRIFUGAL REFRIGERANT GAS COMPRESSOR

Gordon L. Mount, West Monroe, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 30, 1970, Ser. No. 33,242
Int. Cl. F01d *25/00*
U.S. Cl. 415—14 5 Claims

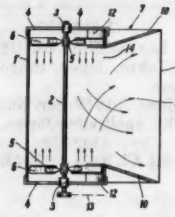
The compressor includes a member engaged by the impeller if the same moves from normal operating position. Instantaneously, upon such engagement, the member is moved

out of engagement with the impeller and effects actuation of contacts in an electrical circuit to signal the movement of the



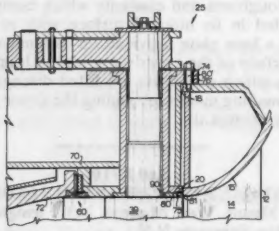
impeller and/or shut down the compressor before damage to the machine takes place.

3,612,711
WINNOWING BLOWER
Hubert Meier, Hilzingen, Germany, assignor to Maschinenfabrik Fahr Aktiengesellschaft, Gottmadingen, Germany
Filed Oct. 23, 1969, Ser. No. 868,770
Claims priority, application Germany, Nov. 8, 1968, P 18 07 874.5
Int. Cl. F01d *3/02*
U.S. Cl. 415—97 **5 Claims**



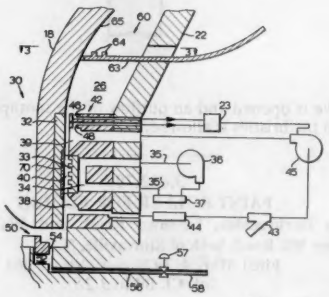
A winnowing blower for combine harvesters or the like comprises an approximately semicylindrical housing with axial fans at its two ends.

3,612,712
HYDRAULIC MACHINE STRUCTURE
Feodor Kanger, and Werner R. Strub, Montreal, Quebec, both of Canada, assignors to Dominion Engineering Works, Limited, Lachine, Quebec, Canada
Filed Dec. 11, 1969, Ser. No. 884,205
Claims priority, application Canada, Dec. 13, 1968, 37,707
Int. Cl. F01d *11/00*
U.S. Cl. 415—110 **7 Claims**



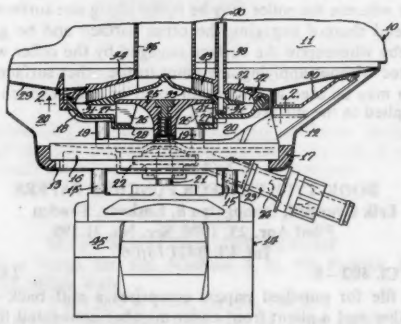
In large turbo-hydraulic machines having a radially outer speed ring for conveying water into or from the machine and stationary structure within the speed ring to contain the machine runner, precise machining of the speed ring is avoided by providing an annular array of spaced axially facing support pads on the speed ring, which are levelled to give a planar support datum for the inner stationary structure; and providing an auxiliary radially extending seal ring welded to the speed ring, to provide sealing engagement with the inner stationary structure.

3,612,713
TWO-PHASE SEAL FOR ROTARY FLUID MACHINES
Douglas Walter Eggins, Scarborough, Ontario; Robert Stanley Sproule, Montreal, Quebec; Feodor Kanger, Montreal, Quebec, Canada, and Peter William Runstadler, Jr., Hanover, N.H., assignors to Dominion Engineering Works, Limited, Lachine, Quebec, Canada
Filed Dec. 22, 1969, Ser. No. 887,066
Claims priority, application Canada, Dec. 23, 1968, 38,485
Int. Cl. F01d *11/00*
U.S. Cl. 415—110 **6 Claims**



A large rotary hydraulic machine such as a pump, pump-turbine, or turbine of the Francis type, having the runner provided with a skirt shroud, includes an annular ice seal surrounding the runner skirt to limit water leakage there past. A temporary seal assists in establishing stabilized operation of the ice seal.

3,612,714
DISHWASHER
James G. Ruspino, St. Joseph, Mich., assignor to Whirlpool Corporation
Filed Oct. 16, 1969, Ser. No. 866,852
Int. Cl. F01d *25/00;* **B08b** *3/00*
U.S. Cl. 415—116 **3 Claims**



A dishwasher having a recirculation centrifugal pump impeller operated to discharge liquid at the discharge periphery of the impeller and with a discharge passage adjacent this

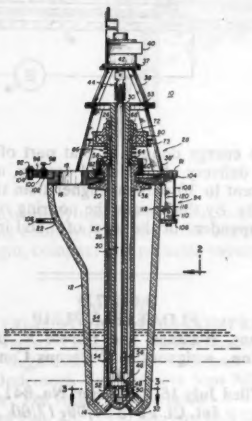
periphery to receive liquid therefrom and having a height substantially less than the corresponding height of the spaced blades of the impeller so that liquid will flow at a greater radial velocity when leaving the impeller than in passing through the blades of the impeller.

3,612,715

PUMP FOR MOLTEN METAL AND OTHER HIGH-TEMPERATURE CORROSIVE LIQUIDS

Shmariahu Yedidiah, West Orange, N.J., assignor to Worthington Corporation, Harrison, N.J.

Filed Nov. 19, 1969, Ser. No. 877,950
Int. Cl. F01d *5/14, 5/28*
U.S. Cl. 415—131 **18 Claims**



A pump for pumping molten metal and other high-temperature corrosive liquids is disclosed, which pump includes a casing constructed of refractory material and having an inlet opening at one end thereof. Pumping means are located within the casing for drawing a liquid into the casing through its inlet opening with the pumping means including: a rotatable refractory impeller; a refractory sleeve joined at one end thereof to the impeller and rotatable therewith, with the sleeve and casing defining an annular passageway through which the liquid passes; and a drive shaft located for at least a portion of its length within the sleeve, one end of the drive shaft being connected in driving relationship with the impeller. By virtue of being located within the sleeve, the drive shaft can impart rotation to the impeller and yet not be exposed to the high-temperature corrosive liquid being pumped. As an added feature, a cylindrical tube portion of the pump frame is disposed between the drive shaft and the refractory sleeve and carries a bearing for rotatably supporting the drive shaft. Since the bearing is located within the refractory sleeve, it can be positioned extremely close to the impeller, but yet never be immersed in the fluid being pumped.

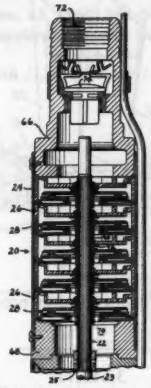
3,612,716

MULTISTAGE CENTRIFUGAL PUMP

Elmer M. Deters, Muscatine, Iowa, assignor to Red Jacket Manufacturing Company, Davenport, Iowa

Filed June 15, 1970, Ser. No. 46,268
Int. Cl. F04d *1/00, 1/06*
U.S. Cl. 415—140 **13 Claims**

Several embodiments of pumps are shown which are advantageous in pumping liquids containing abrasives. FIGS. 1–4 show a centrifugal pump with floating stages. Each stage has a rubber journal and a stainless steel bushing which provide a radial bearing as well as a seal between the impeller chamber and diffuser passages. The other embodiments show other forms of the bearing and journal members applied to a stacked (nonfloating) impeller type of centrifugal pump. In



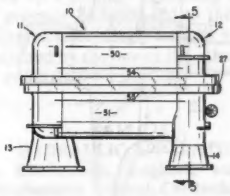
FIGS. 7 and 8, one of the members is tapered to allow the motor to operate more easily in liquids containing abrasives.

3,612,717

CENTRIFUGAL GAS COMPRESSION MACHINE

Rodney C. Burns, Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 9, 1969, Ser. No. 883,541
Int. Cl. F01d *25/24*
U.S. Cl. 415—219 **3 Claims**



A multistage gas compressor of the horizontally split type embodying a weldment structure fabricated from metallic plate material. The outlet end structure initially includes a one-piece annular outer section having a flange abutting the end of the cylindrical barrel section of the casing housing the multistage impeller and diaphragm assembly and being welded thereto. A bearing supporting construction is fixed in the outer section. A curved plate is fixed at one end to the construction and extends in spiral configuration about the construction forming a volute gas passage. The spiral plate is supported by radially disposed web plates welded to the construction and to the spiral plate. A discharge conduit communicates with the larger end of the volute passage.

3,612,718

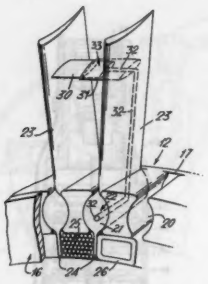
BLADED MEMBER FOR A FLUID FLOW MACHINE

Jack Palfreyman, and Henry Edward Middleton, both of Derby, England, assignors to Rolls-Royce Limited, Derby, England

Filed Dec. 15, 1969, Ser. No. 885,173
Claims priority, application Great Britain, Dec. 16, 1968, 59739/68
Int. Cl. F01d *5/10*
U.S. Cl. 416—135 **8 Claims**

A bladed member for a fluid flow machine comprises a plurality of angularly spaced-apart aerofoil-shaped blades

whose root portions are pivotally mounted in a common blade support member, resilient means being provided for



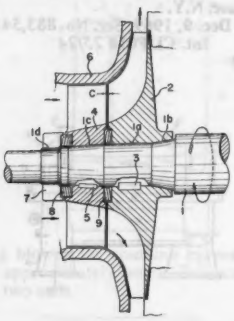
resiliently urging the blades towards predetermined relative angular positions.

3,612,719

MEANS FOR SUPPORTING AN IMPELLER OF A CENTRIFUGAL COMPRESSOR

Jiro Nomura, Nagasaki Prefecture, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 25, 1969, Ser. No. 844,796
Claims priority, application Japan, Aug. 20, 1968, 43/59426
Int. Cl. F01d *5/04*
U.S. Cl. 416—183 **5 Claims**



In a centrifugal compressor, a rotatable shaft has conically tapered portions and an impeller and a front vane are mounted, as separate components, on the tapered portions of the shaft. A first buffer member or spring is interposed between a retaining member and the inlet end of the front vane assembly. A second buffer member or spring is interposed between the vane assembly and the impeller. The buffer members may be in the form of conical springs. The first buffer member is substantially stronger than the second buffer member, and both buffer members act in the same direction to bias the vane and the impeller to the respective tapered portions of the shaft to prevent radial gaps between the vane and the shaft and between the impeller and the shaft.

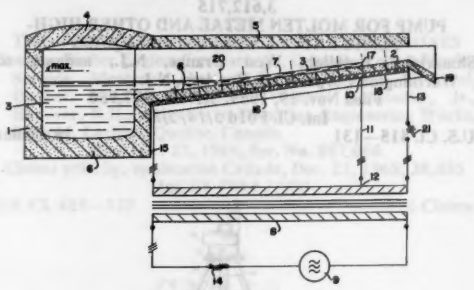
3,612,720

METHOD OF APPORTIONING LIQUID METAL IN AN ELECTROMAGNETIC CONVEYOR TROUGH

Axel von Starck, Remscheid-Luttringhausen, Germany, assignor to AEG-Elotherm GmbH, Remscheid-Hasten, Germany

Filed May 2, 1969, Ser. No. 821,479
Claims priority, application Germany, Oct. 1, 1968, P 18 00 124.6
Int. Cl. F04b *19/04*
U.S. Cl. 417—50 **2 Claims**

In the delivery of liquid metal in an electromagnetic conveyor trough from a bath, e.g., a melting vessel or a hot holding vessel, there is a difficulty in reconciling the propelling of liquid metal along the trough and the intermittent delivery of metal in predetermined quantities, and this difficulty is overcome according to the invention by controlling the energy density in that part of the coil which regulates the propelling of the liquid metal in the trough so that it is exclusively determined by the energy density in that part of the coil which regulates the delivery of the liquid density, namely that it is from 10 percent to 30 percent higher than the said delivery current density. By this means the pouring rate of the liquid becomes independent of the level of metal in the said liquid metal bath.

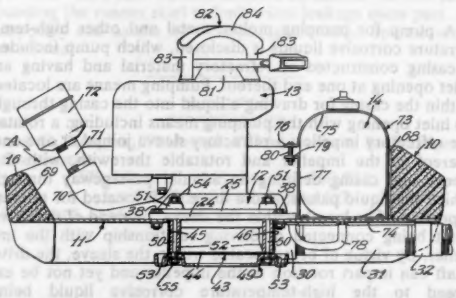


3,612,721

FLOATABLE PUMP

Louis B. Evans, Hastings, and Harold A. Berglund, Afton, both of Minn., assignors to Waterous Company, St. Paul, Minn.

Filed July 15, 1969, Ser. No. 841,953
Int. Cl. F04b *21/00, 17/00*
U.S. Cl. 417—61 **9 Claims**



A float supports a centrifugal pump driven by an internal combustion engine. A carrier handle is provided on one side of the float, and a top supporting handle permits the device to be lowered into the water on a horizontal plane with the motor running when desired. Skids extend beneath the level of the float to protect the float if the pump is dragged along the ground.

3,612,722

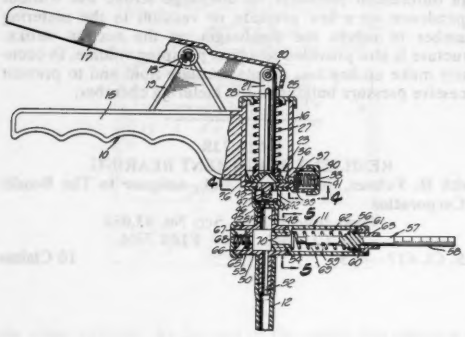
HAND VACUUM PUMP

Theodore C. Neward, 2066 West 11th St., Upland, Calif.

Filed Mar. 3, 1969, Ser. No. 803,854
Int. Cl. F04b *21/02, 23/00, 49/00*
U.S. Cl. 417—63 **11 Claims**

A small and compact vacuum pump which serves as a portable vacuum source. The pump includes a cylinder coupled with one handle and a piston therein coupled with another handle, along with a wafer valve assembly for allowing a vacuum to be drawn at an outlet of the pump. An in-

dicator may be coupled with the outlet and may include a member for releasing the vacuum. The pump and indicator



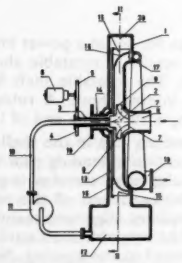
assembly are particularly useful with vacuum extractors used by doctors during childbirth, or any other use that requires a simple, lightweight, compact and portable vacuum source.

3,612,723

CENTRIFUGAL FLUID VANES COMPRESSOR

Pieter van Staveren, Pijnacker, Netherlands, assignor to Nederlandse Organisatie Voor Toegepast Natuurweten Schappelijk Onderzoek Ten Bahoeve Van Nijverheid Handel En Verkeer, The Hague, Netherlands

Filed Feb. 25, 1970, Ser. No. 13,932
Claims priority, application Netherlands, Feb. 25, 1969, 6902892
Int. Cl. F04f *11/00;* **F04d** *17/18*
U.S. Cl. 417—67 **2 Claims**



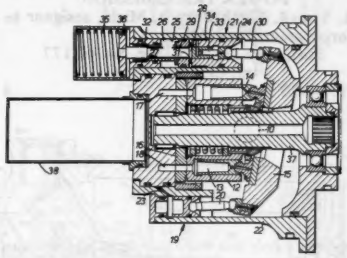
The invention relates to a centrifugal fluid vanes compressor wherein a driven rotor is provided with jet channels for supply of liquid which on rotation form liquid vanes effecting a compressive action upon a gaseous medium between two parallel walls bounding the space for the fluid vanes. It is a feature of the invention that at least one of the said parallel walls can rotate freely and concentrically with the rotor and that a ring of blades is mounted perpendicular to the surface of said wall and substantially at its periphery, the said blades being bent backward with respect to the direction of rotation of the driven rotor so as to cooperate with the fluid vanes, said blades being interconnected over their entire fronts by a wire mesh screen which bounds the discharge of the compressed gaseous medium.

3,612,724

HYDRAULIC APPARATUS

John Denis Smith, Wolverhampton, England, assignor to Boulton Paul Aircraft Limited, Wolverhampton, Stafford, England

Filed Dec. 15, 1969, Ser. No. 884,998
Claims priority, application Great Britain, Dec. 14, 1968, 59575/68
Int. Cl. F04b *1/26;* **F15b** *15/18;* **F16b** *41/00*
U.S. Cl. 417—222 **10 Claims**



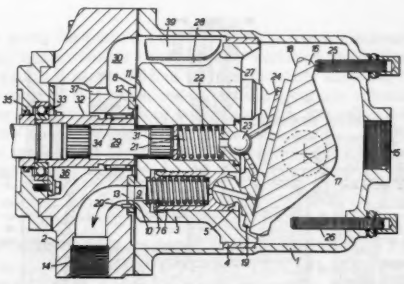
A swash plate pump in which the swash plate is adjustable in accordance with the pump delivery pressure so that piston stroke reduces as delivery pressure increases. A pair of piston-and-cylinder servo units are provided to act oppositely on the swash plate, one of these servo units being fed with liquid at pump delivery pressure and the other servo unit being fed with liquid either at pump delivery pressure or a lower pressure depending on the position of a control valve. The control valve is contained within the said other servo unit and is subjected at one end to pump delivery pressure and at its opposite end to the load of a compression spring whereby to take up a position depending on pump delivery pressure. The pressure of liquid fed to the said other servo unit will be adjusted accordingly and the angle of the swash plate will be adjusted by the one or the other servo unit in accordance with pump delivery pressure.

3,612,725

HYDRAULIC APPARATUS

Peter Spence, Cheltenham, England, assignor to Dowty Technical Development Limited, Cheltenham, England

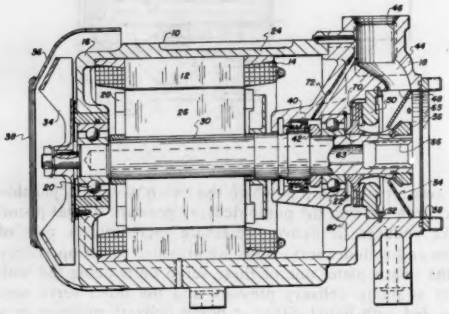
Filed Dec. 8, 1967, Ser. No. 690,369
Claims priority, application Great Britain, Dec. 14, 1966, 56097/66
Int. Cl. F04b *23/12*
U.S. Cl. 417—203 **6 Claims**



A swashplate pump comprising a rotary cylinder block having cylinders disposed parallel or inclined to the rotation axis, valve means cooperating with the cylinder block during rotation, swashplate means located adjacent to one end of the cylinder block for causing reciprocation of pistons in the cylinders during block rotation, passages or vanes or other

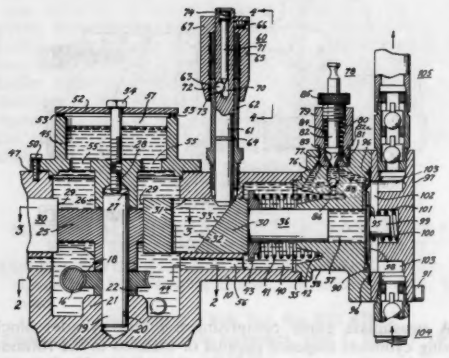
hydrokinetic pumping means formed in or on the cylinder block, a casing surrounding the swashplate means and the cylinder block at least in part and a hydraulic inlet to the casing such that during rotation of the cylinder block liquid is kinetically pumped by the kinetic pumping means on the cylinder block to pass initially over the swashplate and then to and through the kinetic pumping means for delivery to the valve inlet for pumping by the pistons in the cylinder block.

3,612,726
POWER TRANSMISSION
Gordon H. Yowell, North Branch, Mich., assignor to Sperry Rand Corporation, Troy, Mich.
Filed May 25, 1970, Ser. No. 40,177
Int. Cl. F04b *17/00*
U.S. Cl. 417—370 **4 Claims**



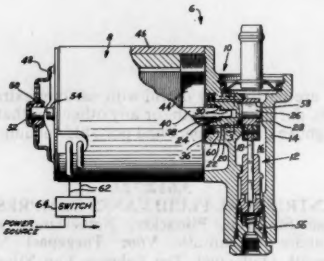
An electric motor pump unit has a centrifugal pump built into one end bell with an open ball bearing inboard of the impeller and a shaft seal inboard of the bearing. From the outlet of the pump, a small bypass is provided through the ball bearing and around the shaft seal to the pumping inlet for cooling purposes. The bypass is in thermal conducting relation to the air inside the electric motor. The unit is especially suited for driving a high-pressure hydraulic pump, the inlet of which is supercharged by the centrifugal pump of the motor pump unit.

3,612,727
METERING PUMP
William W. Drake, Horsham, Pa., assignor to Crane Co., Warrington, Pa.
Filed Oct. 17, 1969, Ser. No. 867,172
Int. Cl. F04b *9/08, 35/02, 43/06*
U.S. Cl. 417—388 **8 Claims**



A metering pump is provided which uses the forward movement of a plunger reciprocating in a metering chamber to force a noncompressible fluid against one side of a flexible diaphragm, thereby moving the diaphragm forward, and which uses a spring or other resilient means on the other side of the diaphragm to move it backwards as the plunger returns, thereby providing a means to pump fluids against high differential pressures on discharge stroke but without dependence on a low pressure or vacuum in the metering chamber to return the diaphragm on the suction stroke. Structure is also provided to adjust pumping volume, to accurately make up any loss of intermediate fluid and to prevent excessive pressure buildup in the metering chamber.

3,612,728
RESILIENT ALIGNMENT BEARING
Keith H. Fulmer, South Bend, Ind., assignor to The Bendix Corporation
Filed June 3, 1970, Ser. No. 43,052
Int. Cl. F04b *17/00;* **F16d** *3/06*
U.S. Cl. 417—415 **10 Claims**

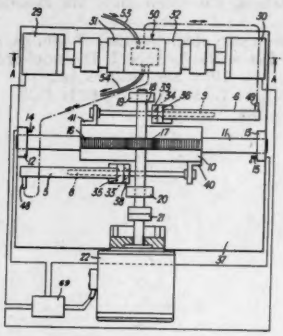


A pumping apparatus for use in a power braking system. A bearing in a housing retains a rotatable shaft eccentrically connected to a piston. The rotatable shaft has a slot at the bottom of a stepped internal bore. A rotor of an electric motor is surrounded by a shell. One end of the rotor shaft is retained by an end bearing cap in the shell while the other end has a flattened portion extending past the open end of the shell. A resilient alignment member is positioned in the stepped bore. The flattened end of the armature shaft is guided through the resilient alignment member into engagement with the slot of the rotatable shaft until the surrounding shell is abuttingly secured to the housing. Now, any rotation of the armature shaft will be directly transferred by the rotatable shaft to provide reciprocating movement movement to the pump piston supplying fluid pressure to the braking system.

3,612,729
VOLUMETRIC METERING PUMP
Roger Commarmot, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France
Filed Mar. 28, 1969, Ser. No. 811,335
Claims priority, application France, Mar. 29, 1968, 146,469
Int. Cl. F04b *35/04, 23/06, 39/08*
U.S. Cl. 417—415 **3 Claims**

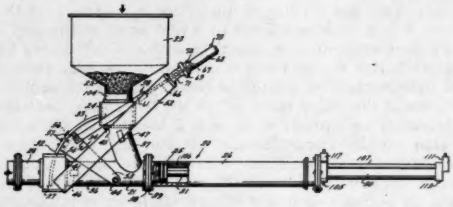
The specification describes a volumetric metering pump for accurately dosing very small quantities of liquid, in which two pistons are arranged to extend in opposite directions, and are interconnected by a crossmember. Small pulse jerks are simultaneously applied to each piston, so that one piston draws liquid into its cylinder and the other expels liquid from

its cylinder. A slide valve is provided firstly to direct liquid from an inlet duct to one cylinder and to an outlet duct from



the other cylinder. At the end of the stroke this situation is reversed.

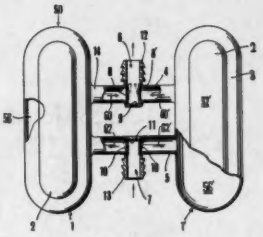
3,612,730
CONCRETE PUMPING MACHINE
Gerald H. Reinert, Cold Spring, Ky., assignor to DESA Industries, Inc., Cockeysville, Md.
Filed Nov. 10, 1969, Ser. No. 875,439
Int. Cl. F04b *7/02, 15/02*
U.S. Cl. 417—507 **16 Claims**



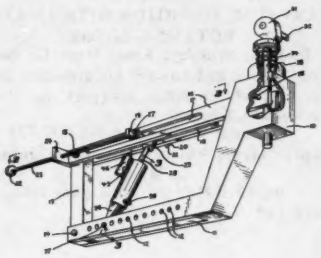
A concrete pump in which a central housing is provided with inlet and outlet valves angularly spaced about a bearing. Arcuate valve members mounted on a framework swing on the bearing between a first position in which the inlet valve is open and the outlet valve is closed and a second position in which the outlet valve is open and the inlet valve is closed. A pump cylinder communicates with the interior of the central housing and houses a piston which moves back and forth therein to draw concrete into the central housing through the inlet valve and to expel the concrete through the outlet valve.

3,612,731
TREADLE-TYPE PNEUMATIC PUMP
Keigo Tanemoto, No. 2-12-1 Aoto Katsushika-ku, Tokyo, Japan
Filed Oct. 20, 1969, Ser. No. 867,577
Int. Cl. F04b *23/04, 21/02, 9/02*
U.S. Cl. 417—533 **4 Claims**

A treadle-type pneumatic pump includes means defining two pumping chambers with compressible walls arranged in spaced relationship and interconnected by conduit means to provide for the alternate inlet and discharge of air upon the release and the collapse of the walls of the respective chambers. The device advantageously includes chambers formed of a material such a plastic and which are provided with pump walls of a general outline of a person's foot to permit the walls and the interior chamber to be alternately compressed and opened by the upward and downward movement of the feet of the user to affect the pumping action.



3,612,732
CATALYST PUMP
Larry C. Stephans, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.
Filed May 15, 1970, Ser. No. 37,762
Int. Cl. F04b *13/00*
U.S. Cl. 417—554 **1 Claim**

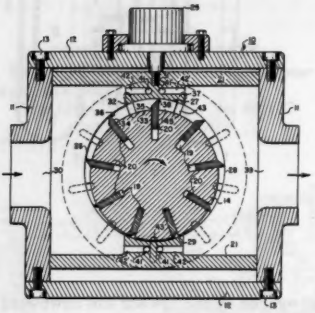


A pump for pumping catalyst and the like is disclosed. The pump has a variable stroke piston. Variation in the stroke of the piston is accomplished by incrementally adjusting the attachment of the piston rod at various locations substantially along the entire length of a pumping arm. the pump piston is hollow with an outlet at the uppermost portion thereof and with means for directing flow from the inlet to the outlet thereof.

3,612,733
PORTING FOR VARIABLE DISPLACEMENT VANE PUMP WITH ROTATING END PLATES
John P. Wilcox, Columbus, Ohio, assignor to J. I. Case Company, Racine, Wis.
Filed May 25, 1970, Ser. No. 41,148
Int. Cl. F01c *21/16;* **F04c** *15/04, 29/10*
U.S. Cl. 418—16 **18 Claims**

A single-lobe sliding-vane rotary fluid pump in which end plates are affixed to the rotor. The cam ring is moved to adjust the displacement rate. This also varies the timing

between port spaces, in the cam ring, and the vanes. To overcome the variations, auxiliary ports in the sealing spaces of



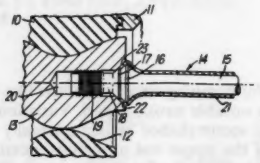
the cam ring cooperate with grooves in the rotor end plates to provide additional fluid paths that control the timing.

3,612,734

ROTARY PUMP OR MOTOR WITH AN AXIALLY ROTATING ROTOR

Peter A. Dawson, Bromley, Kent; Hans G. Pahl, Hutton, Brentwood, Essex, and Edward J. Carpenter, Barnet, Hertfordshire, all of England, assignors to Mono Pumps Limited, London, England

Filed June 5, 1969, Ser. No. 830,733
Claims priority, application Great Britain, June 5, 1968, 26743/68
Int. Cl. F01c *1/10, 5/00;* **F04c** *1/06*
U.S. Cl. 418—48 **5 Claims**



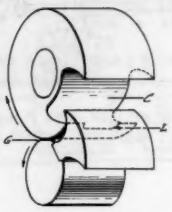
The specification discloses a rotary helical gear pump having a stator formed with at least one helical gear and a rotor mounted therein formed with at least one helical gear meshing therewith, the number of starts of the gear or gears and the stator differing by one from that of the rotor. A flexible drive shaft is secured to the rotor in one of a number of different ways, to drive the rotor, the drive shaft being coated with a nonpermeable and nonporous layer, which is effectively sealed to the rotor, to reduce the effects of corrosion fatigue.

3,612,735

ROTARY ENGINE

Anthony Graham, Go Home Bay, via Penetang, Ontario, Canada

Continuation-in-part of application Ser. No. 743,234, July 8, 1968, now Patent No. 3,453,992. This application July 7, 1969, Ser. No. 839,442
Int. Cl. F02b *55/16;* **F01c** *1/08*
U.S. Cl. 418—189 **1 Claim**



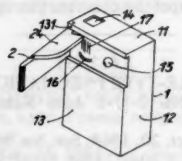
A rotary-type device having a piston rotor and a ceiling rotor for companionate engagement one with the other on rotation of the same and a housing for the rotors, the piston rotor having a piston with a trailing face adapted to coact cyclically with the trailing edge of a gap in the ceiling rotor into which the piston penetrates on each rotation, with the trailing face of the piston being characterized by a curve which maintains a close labyrinth-type seal as the edge of the gap sweeps across the trailing edge of the piston, the lateral profile of the piston being characterized by a curve such that, where a first circle is defined by a first point on the edge of the ceiling rotor rotating about the center of rotation of said rotor; where a second circle is defined by a second point on the outer surface of the piston rotating about the center of rotation of the piston rotor; where the line joining centers of rotation of said rotors is of such a length that the circles overlap and the circumferences cut said line; where the circles rotate at a constant ratio of rotation in opposite directions; said face curve is the path taken by said first point from its entrance into said second circle to its intersection with said line.

3,612,736

SYSTEM FOR ACTUATING CIGARETTE LIGHTERS

Gerhard Steuernagel, Darmstadt-Eberstadt; Claus C. Cobarg, Steinbach, Taunus, and Dieter Rams, Konigstein, Taunus, all of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 18, 1969, Ser. No. 843,047
Claims priority, application Germany, July 20, 1968, P 17 82 114.6
Int. Cl. F23q *3/01*
U.S. Cl. 431—130 **5 Claims**



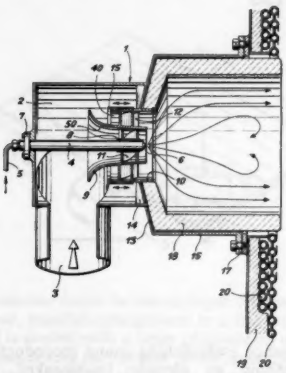
A system for actuating the electric ignition and the burner valve of a gas lighter has an actuating member normally at rest within the contour of the lighter casing; the actuating member can be moved to an active position outside the contour, thereby actuating the valve and ignition.

3,612,737

TURBULENCE MUFFLE BURNER

Harendra Nath Sharan, Seuzach, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Nov. 28, 1969, Ser. No. 880,683
Claims priority, application Switzerland, Nov. 27, 1968, 17646/68
Int. Cl. F23m 9/08
U.S. Cl. 431—183 9 Claims



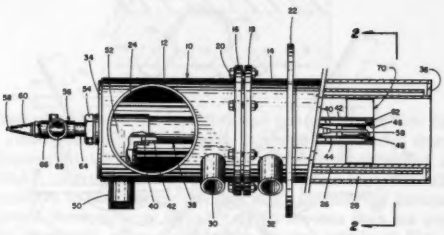
The turbulence muffle burner is provided with a tubular member in surrounding relation to the burner to define at least two annular ducts. Air is directed through the ducts and directed into twisting paths within the ducts so that the velocity and the tangential velocity component of the air leaving the innermost duct are greater than the velocity and the tangential velocity component of the air leaving the outermost duct.

3,612,738

METALLURGICAL BURNER

Robert D. Jones, and Keith A. Miller, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 12, 1970, Ser. No. 2,114
Int. Cl. F23q 3/00
U.S. Cl. 431—265 8 Claims



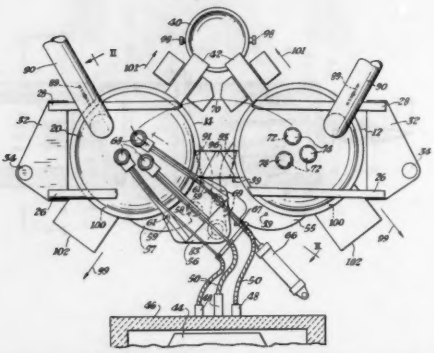
An industrial burner of the post mix type capable of being operated using a natural gas-air mixture or a mixture of natural gas and air that has been enriched with industrial oxygen. The burner is characterized in that a stator is used to assure post mixing thereby preventing explosion from flashback. Water cooling, self-contained ignition and an integral pilot flame are further features of the burner.

ELECTRICAL

3,612,739
DUAL ELECTRIC FURNACE FACILITY

Simon M. Korneff, Fair Hill Road, Box 326, R.D. #4, Sewickley, Pa.

Filed Feb. 5, 1970, Ser. No. 8,998
Int. Cl. F27d *11/10*
U.S. Cl. 13—9 17 Claims

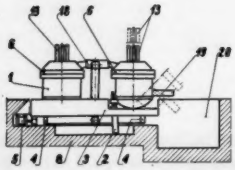


A dual electric furnace facility comprising a pair of furnace shells, each of said shells having at least one electrode opening similarly positioned therein, an electric supply system, an electrode structure including at least one electrode and capable of movement to positions of insertion through either one of said electrode openings, means for electrically connecting said electrode structure to said supply system, and means for alternately moving said electrode structure to said positions.

3,612,740
ARRANGEMENT FOR PRODUCTION OF METAL ALLOYS STEEL ALLOYS IN PARTICULAR

Adam Gierek, Katowice; Leopold Juszczyk, Katowice, and Filip Meder, Zabrze, all of Poland, assignors to Huta Zabrze, Zabrze, Poland

Filed Jan. 7, 1969, Ser. No. 789,499
Claims priority, application Poland, Jan. 8, 1968, P124569
Int. Cl. F27b *3/06, 19/00*
U.S. Cl. 13—9 4 Claims

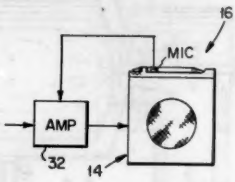


Apparatus for producing metal alloys including a plurality of furnaces mounted for movement past a series of stations, at which there are a preheating burner, electrodes for melting a charge and electrodes for refining the charge.

3,612,741
ELECTRONIC MUSICAL INSTRUMENT EMPLOYING MECHANICAL RESONATORS WITH REGENERATIVE EFFECTS

Fred C. Marshall, 1310 Third St., Berkeley, Calif.

Continuation-in-part of application Ser. No. 602,699, Dec. 19, 1966. This application Dec. 4, 1969, Ser. No. 881,980
Int. Cl. G10h *3/00, 3/02*
U.S. Cl. 84—1.05 4 Claims

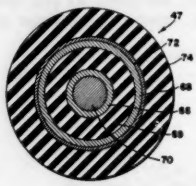


A performance embellishing sound reproduction arrangement comprising an electric loudspeaker, an electric resonance device secured to the chassis of said loudspeaker in contact therewith and having a microphone and a plurality of strings tuned to selected different audiofrequencies to resonate sympathetically whenever a musical production reproduced by the loudspeaker sounds the frequencies to which the strings are tuned, and circuitry for feeding the electric signals derived from the microphone of the resonance device back to the same loudspeaker, or to a second loudspeaker located within the range of audibility of the first-mentioned loudspeaker.

3,612,742
ALTERNATING CURRENT SUPERCONDUCTIVE TRANSMISSION SYSTEM

Donald P. Snowden, San Diego, and George P. Gamble, La Jolla, both of Calif., assignors to Gulf Oil Corporation

Filed Feb. 19, 1969, Ser. No. 800,571
Int. Cl. H01b *7/34*
U.S. Cl. 174—15 10 Claims

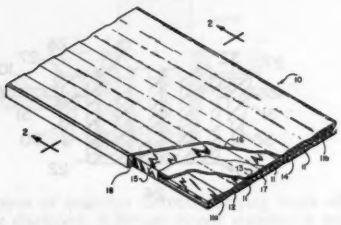


An alternating current superconductive transmission cable and system are provided in which two superconductive conductors are positioned coaxially and separated by insulation. Normally conductive layers are placed within the inner conductor and around the outer conductor to dissipate heat transients. For transmitting large currents the superconductive conductors are formed of a composite material of coaxial alternating layers wherein layers of superconductive material are positioned between layers of nonsuperconductive material.

3,612,743
SHIELDED FLAT CABLE

Wilhelm Angele, Huntsville, and Bobby W. Kennedy, Arab, both of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Division of Ser. No. 723,488, Apr. 23, 1968, Patent No. 3,576,723.
Filed Oct. 13, 1970, Ser. No. 80,369
Int. Cl. H01b *11/06*
U.S. Cl. 174—36 9 Claims

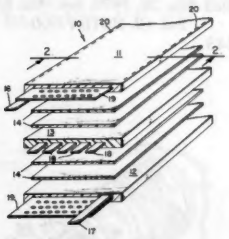


A flat conductor cable having multiple ribbonlike conductors in spaced, parallel arrangement in a flat strip of insulating material is coated with a layer of shielding metal such as copper by roughening the surface of the insulating strip, contacting the strip with an electroless plating bath and then with an electrolytic plating bath. Contact of the metal shield with a ground conductor is obtained by exposing a portion of one or more conductors along the length of the cable prior to plating. An outer layer of insulating material is applied over the shielding layer.

3,612,744
FLEXIBLE FLAT CONDUCTOR CABLE OF VARIABLE ELECTRICAL CHARACTERISTICS

Philip J. Thomas, Fillmore, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 27, 1969, Ser. No. 802,811
Int. Cl. H01b *7/08*
U.S. Cl. 174—36 14 Claims

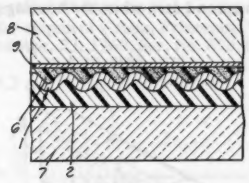


A flexible multiple flat conductor electric cable fabricatable in long lengths with variable and uniform characteristic impedance. The cable comprises a conductive layer, at least one flat dielectric layer continuous to each face of the conductive layer, and a ground plane layer contiguous to the outer face of each outermost dielectric layer. The flat conductor layer or continuous-wiring cable comprises a planar array of parallel spaced flat conductive strips preferably encapsulated in thin dielectric film. The dielectric layers are of materials, thicknesses, number, and configurations to provide a specific predetermined or a range of desired electrical characteristic values. The ground plane layer comprise conductive metal foil, optionally solid or perforated and optionally encapsulated. A flat conductor drain line may be disposed contiguously inward of the ground plane layer. The cable layers are loosely coupled by sewing or other interrupted bonding near the cable edges.

3,612,745
FLEXURAL BUS BAR ASSEMBLY

Robert A. Warren, Sunland, Calif., assignor to The Sierracin Corporation, Sylmar, Calif.

Filed July 8, 1970, Ser. No. 53,143
Int. Cl. H05b *3/06*
U.S. Cl. 174—68.5 14 Claims

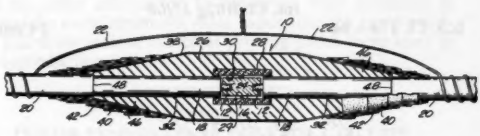


Described herein are bus bars and bus bar assemblies for, e.g., incorporation in electrically powerable laminated transparencies. Metal foil bus bars are flexurally configured or laterally corrugated to be longitudinally dimensionally responsive to thermal contraction and expansion of laminae adjacent the interlayer films in which the bus bars are partially immersed, when the bus bar-bearing interlayer film is incorporated in an electrically powerable laminated transparency. The bus bar-interlayer film assembly can be provided with a thin electrically conductive metallo-thermoplastic tape disposed over the bus bar and providing area contact with electrically conductive metallic coatings powered by the bus bar. The metallo-thermoplastic is rendered electrically conductive by the incorporation therein of finely divided conductive metal particles. The bus bar itself can be laterally plicate, rugulose, nodulose, or otherwise flexurally configured.

3,612,746
CABLE-SPLICING DEVICE FOR HIGH-VOLTAGE CABLES

Edward L. Sankey, New Berlin, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Feb. 14, 1969, Ser. No. 799,365
Int. Cl. H02q *15/08*
U.S. Cl. 174—73 R 5 Claims



Disclosed herein is a preformed unitary self-sealing device for making an insulated high-voltage splice between two solid insulated cables having a connector connected to the electrical conductors of the cables. The preformed device comprises a conductive sleeve embedded in a sleeve of elastomeric material. The conductive sleeve electrically engages the connector and bridges the connection.

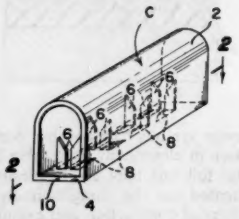
3,612,747
NONSTRIP CONNECTOR FOR INSULATED ELECTRICAL CONDUCTORS AND ELECTRICAL CONDUCTORS THEREFOR

Bernard Edward Shlesinger, Jr., 3906 Bruce Lane, Annandale, Va.

Filed Feb. 14, 1969, Ser. No. 799,252
Int. Cl. H02g *15/08*
U.S. Cl. 174—84 C 18 Claims

A nonstrip connector for insulated electrical conductors comprising an elongated crimpable housing including conduction means; the housing having portions having a first noncrimped configuration and subsequently a crimped configuration; the housing including an inside wall forming a

central cavity; the conduction means including insulation piercing means projecting inwardly into the central cavity at all times; the central cavity having a first area for receiving insulated conductor means and an open second area adjacent to said first area when the housing portions are in the noncrimped configuration and a third area for supporting and clamping the insulated conductor means and replacing said first and second areas when the housing portions are in the crimped configuration; the insulation piercing means lying within the open second area when the housing portions are in



the noncrimped configuration and within the third area when the housing portions are in the crimped configuration; the portions of the housing having first said noncrimped configuration having a substantially greater circumference than the portions of the housing having subsequently the crimped configuration; the inside wall of the housing including portions for receiving, clamping and supporting the insulated conductor means prior to and subsequent to crimping; whereby upon crimping, the insulation piercing means will pierce the insulation of the conductor means to electrically connect the housing to the insulated conductor means.

3,612,748

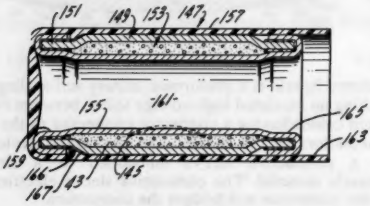
EXPLOSION CONNECTOR

David T. James, De Kalb, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Continuation of application Ser. No. 612,655, Jan. 30, 1967, now abandoned. This application May 21, 1969, Ser. No. 827,130

Int. Cl. H02g *15/08*

U.S. Cl. 174—94 **3 Claims**



A method of connecting wires, cables and the like including the steps of placing the wires inside a deformable shell, placing an explosive on the outside of the deformable shell, confining the explosive by a generally nondeformable outer shell, and igniting the explosive to deform the deformable shell into contact with the wires and the wires into contact with one another.

A connector for joining wires, cables and the like including inner and outer shells and an explosive located between the shells, the explosive functioning, upon ignition, to deform the inner shell into crimping engagement with wires placed therein and the wires into crimping engagement with one another.

3,612,749

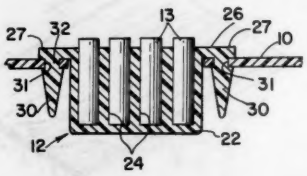
RESILIENT MOUNTING SUPPORT FOR PLURALITY OF ELECTRICAL DEVICES, SUCH AS PIEZOELECTRIC CRYSTALS

Franklin F. Grube, Jr., Westchester, and Michael J. McMahon, Maywood, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 25, 1969, Ser. No. 852,761

Int. Cl. H01b *3/46;* **H01v** *7/00*

U.S. Cl. 174—138 G **2 Claims**



Resilient mounting support for electrical devices, such as piezoelectric crystals, for mounting the same on the chassis of electrical apparatus, such as a radio transmitter and/or receiver. The support includes a block of resilient material having cavities therein for receiving the containers for the devices, and integral mounting tabs for securing the block to the chassis.

The block may be positioned in an opening in the chassis and the mounting tabs may have projections extending in other openings with interlocking projections to hold the same in position. The support may be formed of transparent silicone rubber to protect the devices against shock and vibration and to permit inspection of identifications on the containers through the mounting support.

3,612,750

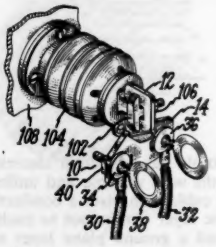
CABLE-CONNECTING ADAPTOR FOR HIGH VOLTAGE BUSHING OF A PAD-MOUNTED TRANSFORMER

Michael J. Monico, Dalton, and Louis B. Casucelli, North Adams, both of Mass., assignors to General Electric Company

Filed Jan. 26, 1970, Ser. No. 5,729

Int. Cl. H01b *17/00*

U.S. Cl. 174—145 **3 Claims**



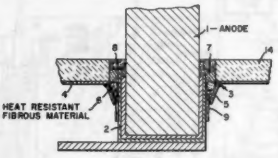
An adapter for the high-voltage bushing of a pad-mounted transformer to convert such bushing to a two-cable hot line tap. The adapter includes a first vertical slotted portion fitting the bushing cable connector and has a second vertical portion at right angles to the first vertical portion with a pair of slots on opposite ends of the second portion which will accept cable terminal connectors for securing cables to the adaptor.

3,612,751

SEALING OF CURRENT-CARRYING LEAD FOR ELECTRODE OF ELECTROLYZER

Evgeny Ivanovich Adaev, 2. Schukinsky, proezd, 10, korpus 1, kv. 56; Alexandr Vasilievich Blinov, ulitsa Gorkogo, 41, kv. 48, and Viktor Alexandrovich Novoselov, ulitsa Vavilova, 10, korpus 2, kv. 28, all of Moscow, U.S.S.R.

Filed Apr. 23, 1969, Ser. No. 818,633
Int. Cl. B01k 3/02; H05b 7/12
U.S. Cl. 174—151 4 Claims



Several types of seals for current-carrying leads of electrolyzers are disclosed. A funnel-shaped member is attached to the housing of the electrolyzer in such a manner that it surrounds the lead as it emerges from the electrolyzer. The annular space between the lead and the funnel-shaped member is sealed with a thermally and chemically resistant packing which is confined therein. Suitable packing materials include slag cotton, asbestos cord and asbestos fluff and fibrous glass.

ERRATUM

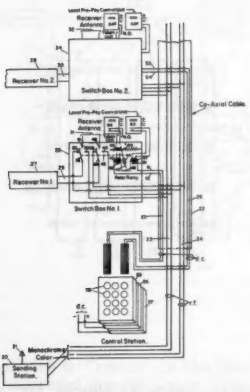
For Class 178—5.4 MA see:
Patent No. 3,613,105

3,612,752

SUBSCRIPTION TELEVISION SYSTEM WHICH RECEIVES EITHER FREE BROADCAST SIGNAL OR PAY WIRED SIGNALS

Thomas A. Banning, Jr., 5500-5520 South Shore Drive, Apt. 1408, Chicago, Ill.

Continuation-in-part of application Ser. No. 459,399, May 27, 1965, now Patent No. 3,365,542, and a continuation-in-part of 490,402, Sept. 27, 1965, now Patent No. 3,478,162. This application June 22, 1966, Ser. No. 559,494
Int. Cl. H04n 1/32, 1/34
U.S. Cl. 178—5.1 14 Claims



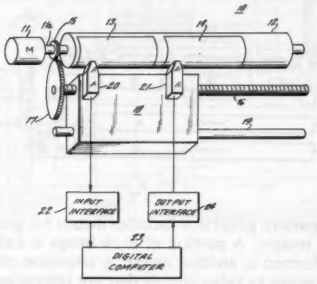
This case discloses wired forms of transmission of the television RF signals, and the audio signals of the program, under control of a control station. with provision for receiving the program either over the air (broadcast) in inferior aesthetic quality, or by the wired transmission, in the superior or aesthetic quality, the former, broadcast transmission being without pay or charge—the latter, wired transmission being for pay or charge. Various forms of the differentials of superior and inferior quality TV programs are disclosed.

3,612,753

SELF-ADAPTIVE SYSTEM FOR THE REPRODUCTION OF COLOR

Nathaniel I. Korman, Princeton, N.J., assignor to Ventures Research & Development Group, Princeton, N.J.

Filed Apr. 23, 1969, Ser. No. 818,489
Int. Cl. H04n 9/02
U.S. Cl. 178—5.2 A 17 Claims



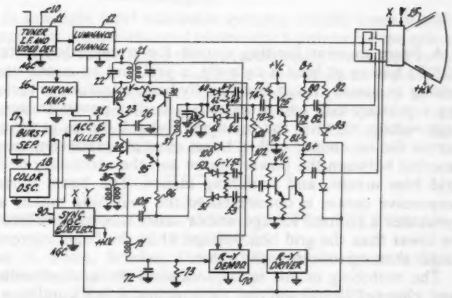
A method and apparatus for the production of color pictures, especially of the "half-tone" variety wherein the color fidelity of the reproduction matches that of the original picture or transparency from which the reproduction is produced. Initial printing plates are produced for printing a color standard which contains every one of a large plurality of arbitrary color patches. The same ink, paper, printing plates and printing process are used to prepare the matrix as will be used in the final production process. The printed matrix is then point-by-point scanned for correlating the original color data with the colors of the printed result so as to fully take account of the characteristics of the ink, paper, plates and printing process. The modified color information is then utilized in the reproduction process during which the picture to be reproduced is scanned point-by-point to determine its tristimulus values (red, green and blue). The color data previously developed operates on the tristimulus values and the color information to determine what excitation is needed for each tristimulus value to sensitize the corresponding points on each of the color printing plates to be used in the reproduction process.

3,612,754

COLOR TEMPERATURE CONTROL CIRCUITS

Robert Dale Altmanshofer, Indianapolis, Ind., assignor to RCA Corporation

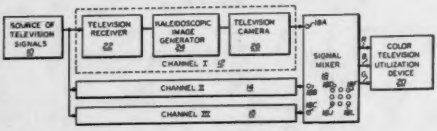
Filed May 11, 1970, Ser. No. 36,056
Int. Cl. H04n 9/18
U.S. Cl. 178—5.4 R 10 Claims



A color temperature control circuit operates between a monochrome and color transmission to alter the background

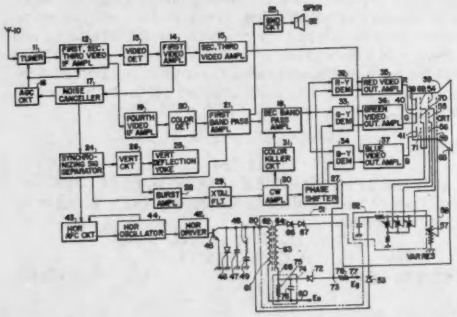
tint of the display by injecting a suitable pulse via a diode which is rendered conductive or nonconductive by means of the color killer circuit included in the receiver. The injected pulse as applied to DC restoring circuits serves to affect the level at which the control electrodes of the kinescope are biased.

3,612,755
COLOR PATTERN GENERATOR
Thomas Carter Tadlock, II, Chevy Chase, Md., assignor to Dorothea Weitzner, New York, N.Y., a part interest
Filed July 3, 1969, Ser. No. 838,928
Int. Cl. H04n *9/02*
U.S. Cl. 178—5.2 R **8 Claims**



A color pattern generator includes means for generating at least three images. A portion of each image is kaleidoscopically transformed to another image. A television camera converts each image to video signals that are intermixed in varying amplitudes to provide three color video signals that are fed to a color television receiver for display.

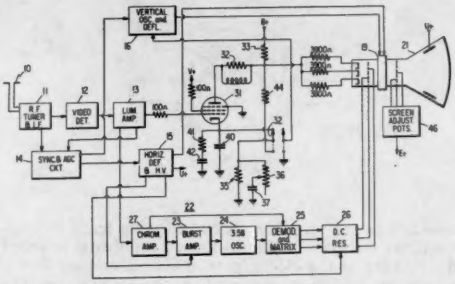
3,612,756
BEAM CURRENT LIMITING CIRCUIT FOR A CATHODE-RAY TUBE
Mitsuharu Akatsu, Yokohama-shi; Takao Yoneyama, Yokohama-shi, and Tadahiko Iwasaki, Kamakura-shi, all of Japan, assignors to Hitachi, Ltd., Tokyo-to, Japan
Filed Apr. 24, 1969, Ser. No. 818,926
Claims priority, application Japan, Apr. 24, 1968, 43/33021
Int. Cl. H04n *9/28*
U.S. Cl. 178—5.4 R **6 Claims**



A beam current limiting circuit for a cathode-ray tube (CRT) having at least a cathode, a grid and an anode comprising an anode circuit having a fly back transformer including a primary coil and a secondary coil, a power source, a high voltage rectifier for rectifying flyback pulses generated across the secondary coil, a beam current responsive means inserted between the power source and the secondary coil, a grid bias means, and switching means. The beam current responsive means is connected to the switching means and generates a control voltage whose value is so determined to be lower than the grid bias voltage while the beam current is larger than a predetermined value.

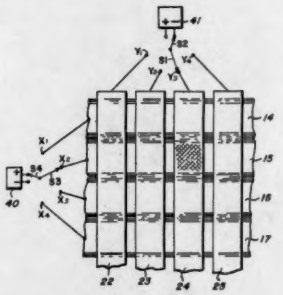
The switching means is responsive to the control voltage and changes its conductive or nonconductive condition to supply the control voltage to the grid when the beam current exceeds the predetermined value, so that the beam current is prevented from exceeding the predetermined value.

3,612,757
COLOR TELEVISION KINESCOPE SETUP APPARATUS
George Edward Anderson, Indianapolis, Ind., assignor to RCA Corporation
Filed Aug. 20, 1969, Ser. No. 851,545
Int. Cl. H04n *5/44*
U.S. Cl. 178—5.4 TE **9 Claims**



A setup control apparatus for a color kinescope uses a switch for removing operating potential from an active device, as a vacuum tube, included in a video information signal channel, while further switching in an impedance for biasing the beam control electrodes of the kinescope at a predetermined level compatible with performing setup adjustments on the kinescope.

3,612,758
COLOR DISPLAY DEVICE
Paul F. Evans, Pittsford; Harold D. Lees, Henrietta; Martin S. Maltz, Fairport, and John L. Dailey, Pittsford, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed Oct. 3, 1969, Ser. No. 863,633
Int. Cl. G02f *1/36;* **H04n** *5/66, 9/12*
U.S. Cl. 178—5.4 R **14 Claims**



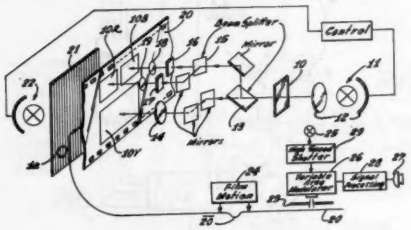
A color display device employing the electrophoretic migration of color pigment particles to form an image on a matrix addressable panel. One coordinate terminal is connected to a line reservoir containing electrophoretic ink particles of a given polarity while the other coordinate terminal is connected to a transparent conductor. The panel is viewed through the transparent conductor side in ambient illumination.

3,612,759

THERMOMAGNETIC MOTION-PICTURE-RECORDING AND MAGNETOPTIC TV-REPRODUCING METHOD AND SYSTEM

Alfred M. Nelson, Redondo Beach, and Daniel J. Marshall, Torrance, both of Calif., assignors to The Magnavox Company, Torrance, Calif.

Filed Aug. 5, 1968, Ser. No. 750,134
Int. Cl. H04n *1/28, 5/78;* H04v *3/04*
U.S. Cl. 178—6.6 A 32 Claims



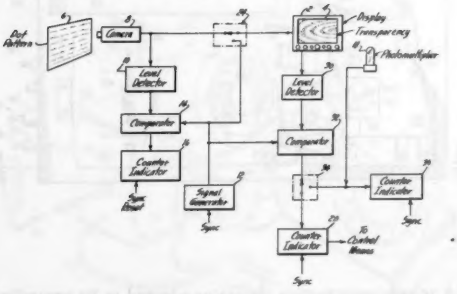
Audiovisual information such as a live scene or a motion picture film with soundtrack is converted into sequences of images each composed of incremental complementary, variable-size image areas used to provide a corresponding two-dimensional modulation of radiant energy. A black and white film is used as an intermediary and for defining the images of he sequence as variable area size, dark-light contrast patterns. The images are thermomagnetically copied on a low-Curie-point magnetic tape. The information on the tape is reproduced as by magneto-optical techniques, and the reproduced information is scanned, resulting in signals processed to control image reproduction as on the picture tube of a TV set.

3,612,760

APPARATUS FOR DETERMINING DISTORTION IN TELEVISION SYSTEMS

John C. McKechnie, 2300 Mohawk Trail, Maitland, Fla.

Filed Oct. 11, 1968, Ser. No. 766,889
Int. Cl. H04n *5/72, 5/21*
U.S. Cl. 178—6.8 1 Claim



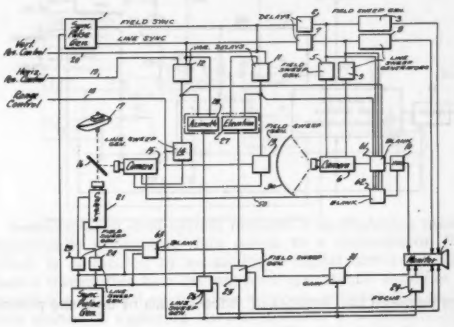
A scanning pattern or "raster" on the face of a television display tube is examined through a matching ruled grid on a transparent sheet placed over the face of the tube. Distortion in the scanning pattern will produce an observable moire fringe interference pattern which can be used to adjust the television control circuits to correct the distortion. A rectangular dot pattern on a transparency can be used in a like manner to generate patterns indicating horizontal and vertical distortion.

3,612,761

LARGE-AREA DISPLAY SYSTEM

Hanns H. Wolff, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 19, 1969, Ser. No. 886,615
Int. Cl. H04n *7/18*
U.S. Cl. 178—6.8 7 Claims



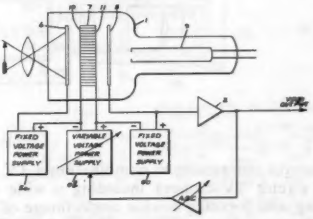
A television system presenting a picture of a large area with relatively coarse resolution in which a small area for the display of a high-resolution picture is blanked out and a high-resolution picture inserted in the blanked out area.

3,612,762

AUTOMATIC GAIN CONTROL SYSTEM FOR CAMERA TUBE

Louis E. Wuellner, Fort Wayne, and Roger C. Thieme, Hoagland, both of Ind., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Mar. 26, 1969, Ser. No. 810,714
Int. Cl. H04n *5/36*
U.S. Cl. 178—7.2 7 Claims



In low-light level television systems, certain camera tubes employ multiplier-channel plates which determine the gain of the camera tube. This gain is automatically controlled in the present invention by developing a control signal representative of the amplitude of the video signal produced by the camera tube and feeding it back to the multiplier-channel plate in such polarity and magnitude as to maintain the video signal at a substantially constant level.

3,612,763

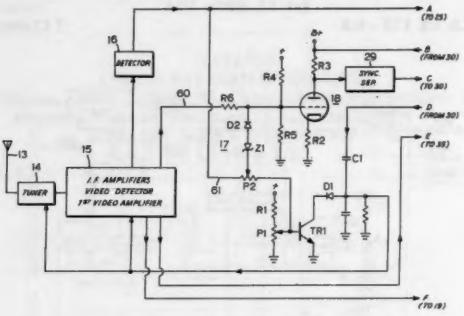
NOISE SUPPRESSION NETWORKS FOR TELEVISION RECEIVERS

Paul V. Bates, Breslau, Ontario, Canada, assignor to Electrohome Limited, Ontario, Canada

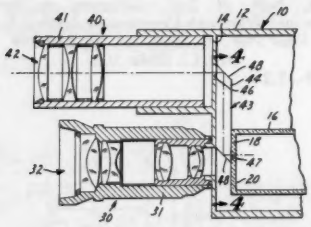
Filed Apr. 25, 1969, Ser. No. 819,279
Int. Cl. H04n *5/44*
U.S. Cl. 178—7.3 R 10 Claims

Noise suppression in a television receiver is achieved by

connecting a semiconductor device in Zener diode configuration between two sources of video signals of opposite polarity.



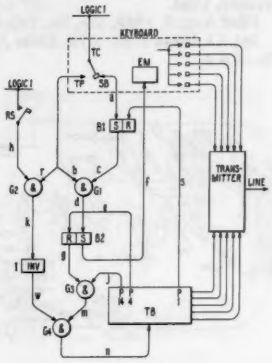
3,612,764
TELEVISION SECURITY MONITOR
David C. Gilkeson, North Oaks, and Patrick R. Novak, Mounds View, both of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.
Filed Nov. 14, 1969, Ser. No. 876,710
Int. Cl. H01j *29/89*
U.S. Cl. 178—7.88 **3 Claims**



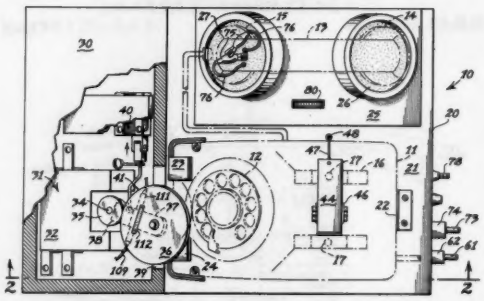
Apparatus comprising in combination a TV monitor and a closed circuit TV camera including a wide angle lens for receiving and focusing a wide angle image of a first subject matter onto a photosensitive surface of the TV camera and including a telephotolens and a periscopic prism for receiving and focusing an enlarged image of a second subject matter, located substantially the same distance from the TV camera as the first subject matter, onto the photosensitive surface of the TV camera.

3,612,765
KEYBOARD LOGIC SYSTEM
Roger William Dawson, Brighton, Sussex, England, assignor to Creed & Company, Brighton, Sussex, England
Filed May 28, 1969, Ser. No. 828,502
Claims priority, application Great Britain, May 30, 1968, 25896/68
Int. Cl. H04l *15/12*
U.S. Cl. 178—17 R **1 Claim**

A keyboard logic system for controlling keyboard locking and the transmitting time base for all operating conditions which includes a trip switch, operated by the actuation of any key, and two bistables. The first bistable is set when no keys are depressed and the second bistable is set when both the first bistable is set and the trip switch is operated. The second bistable serves to lock the actuated key and release the time base. Further means are provided to release the time base at the instant when both the "runout" switch and the trip switch are actuated concurrently.



3,612,766
TELEPHONE-ACTUATING APPARATUS FOR INVALID
Billy G. Ferguson, 8129 Luree Lane, Hermitage, Tenn.
Filed Mar. 16, 1970, Ser. No. 19,796
Int. Cl. H04m *1/00*
U.S. Cl. 179—1 HF **13 Claims**

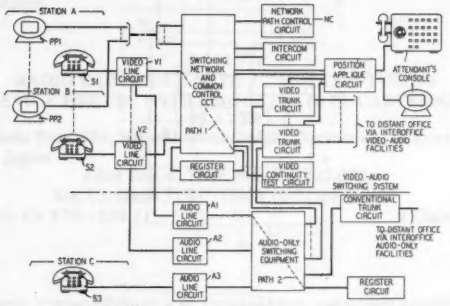


A telephone-actuating apparatus adapted to be controlled solely by the voice of a person, and particularly an invalid, including an electrical control circuit connected to the receiving and transmitting circuits of an existing telephone and adapted to actuate the telephone receiver contact switch element and the dialing mechanism. The control circuit includes gating, relay and timing elements, adapted to close the receiver contact switch element by a voice signal during an initial period and to open the switch element by another voice signal during a subsequent termination period. The control circuit also permits actuation of the dialing mechanism by another voice signal after the termination of the initial period and prior to the commencement of the termination period.

3,612,767
EQUIPMENT FOR SELECTIVELY ESTABLISHING AUDIO AND WIDEBAND COMMUNICATION PATHS THROUGH TWO AUTONOMOUS SWITCHING SYSTEMS

Harold P. Anderson, Lincroft; Floyd K. Becker, Colts Neck; Robert D. Berryman, Red Bank; Nelson Botsford, Jr., Colts Neck; Maurice A. Hoffman, Woodbridge, and Arthur P. Ryan, III, Belmar, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 11, 1969, Ser. No. 832,292
Int. Cl. H04m *11/08*
U.S. Cl. 179—2 TV 28 Claims

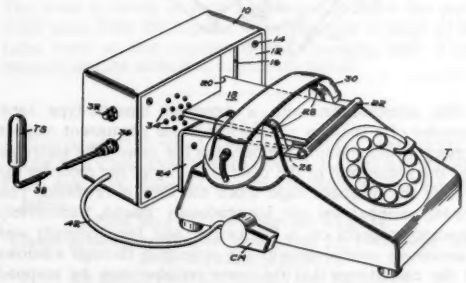


Independently operated switching systems which are actuated on every call are disclosed for establishing via one system audio-only communication paths and via the other system wideband as well as audio communication paths. Initially, both systems are connected on a call and one of them is released by the caller for determining the particular switching system and therefore the necessary switching facilities to be utilized on the call.

3,612,768
TELEPHONE ALARM SYSTEM

David Sherman, 432 Lowell Ave., and Richard L. Myerson, 14 Oak Hill St., both of Newton Centre, Mass.

Filed July 18, 1969, Ser. No. 851,128
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 R 14 Claims

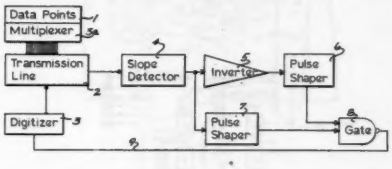


The invention concerns an alarm system for detecting abnormal or emergency conditions and reporting them in response to placement of a call to an associated telephone. The system comprises a circuit including two switch means one operable by a detector in response to an abnormal condition, and the other operable in response to a call placed to the telephone, so that no alarm signal is generated until a call is received. The system need not be incorporated into the telephone circuit, but can be a self-contained unit that transmits an alarm signal via the telephone.

3,612,769
DATA TRANSMISSION

Gary F. Oman, Greendale, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed May 4, 1970, Ser. No. 34,044
Int. Cl. H04j *3/10*
U.S. Cl. 179—15 A 8 Claims

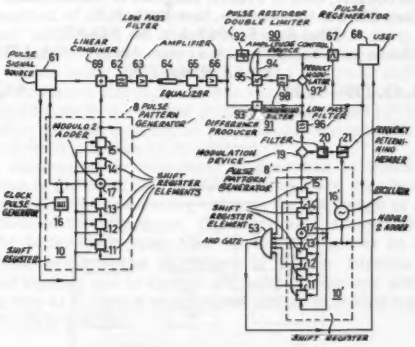


A multiplexed data system includes a multiplexing means sequentially connecting data points to a transmission line which is connected to an analog-to-digital converter. The data is transmitted by a current limit operational amplifier to establish a constant current line response between successive data points. A digitizing control includes a slope-detecting operational amplifier connected to differentiate the line voltage. An inverting pulse shaper and a noninverting pulse shaper are connected to the amplifier to establish a pair of control signals connected to a two-input NAND gate, the output of which is connected to trigger an analog-to-digital converter connected to the line and establish readout in synchronism with the settling of the line voltage.

3,612,770
TRANSMISSION SYSTEM COMPRISING A TRANSMITTER AND A RECEIVER FOR THE TRANSMISSION OF INFORMATION IN A PRESCRIBED FREQUENCY BAND AND TRANSMITTERS AND RECEIVERS TO BE USED IN SAID SYSTEM

Leo Eduard Zegers, and Wilfred Andre Maria Snijders, both of Emmasingel, Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed June 20, 1969, Ser. No. 834,973
Claims priority, application Netherlands, June 29, 1968, 6809257
Int. Cl. H04l *7/00*
U.S. Cl. 179—15 BY 9 Claims

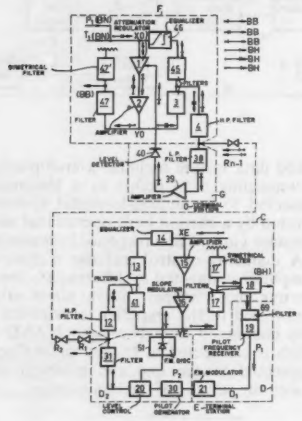


A circuit for separating an auxiliary signal component from a main signal component has a pulse restorer and a difference producer coupled to receive the composite signal. The output of the restorer is coupled to the other input of said difference producer through an amplitude controller so that the signals applied to the difference producer are equal. The difference producer output supplies the auxiliary signal.

3,612,771
DUAL-BAND LINE TRANSMISSION SYSTEM

Paul Victor Caniquit, Essonne, France, assignor to S. A. Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed July 29, 1969, Ser. No. 845,754
Claims priority, application France, Aug. 9, 1968, 162505
Int. Cl. H04j 1/14
U.S. Cl. 179—15 BP 8 Claims

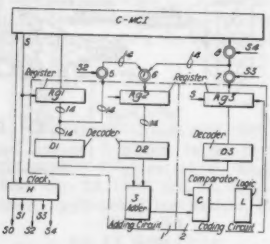


A transmission system has two terminal stations and at least one repeater station. One terminal station transmits a first pilot signal which is passed through the repeater station without effecting any amplitude control devices. The second terminal station transmits a second pilot signal, which is time modulated by the received first pilot signal, and is used to control amplitude control devices. Therefore, both frequency independent and dependent attenuators can be compensated.

3,612,772
CIRCUIT FOR ADDING CODES RESULTING FROM NONLINEAR CODING

Claude Paul Henri Lerouge, Maurepas, and Jean Perrault, Port-Marly, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 9, 1969, Ser. No. 843,875
Claims priority, application France, Apr. 11, 1968, 147 879
Int. Cl. H04m 3/56
U.S. Cl. 179—18 BC 6 Claims

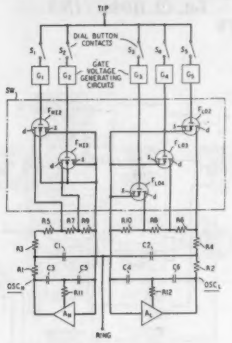


A PCM circuit adds the speech codes of subscribers who are participating in a conference call. A decoding circuit decodes two PCM codes, and the resulting analog voltages are added together. The sum of the analog voltages are reencoded and sent out to the other subscribers.

3,612,773
ELECTRONIC FREQUENCY SWITCHING CIRCUIT FOR MULTIFREQUENCY SIGNAL GENERATOR

Charles E. Riehm, Jr., Indianapolis, Ind., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed July 22, 1969, Ser. No. 843,321
Int. Cl. H04m 1/51
U.S. Cl. 179—90 K 2 Claims

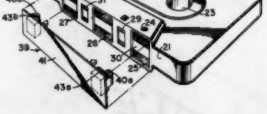


Signal frequency combinations in a multifrequency signal generator are produced selectively by establishing conductive paths through switched insulated-gate field-effect transistors (IGFETS) to connect respective frequency determining elements into the oscillator circuits.

3,612,774
SNAP-ON ERASING MEMBER FOR COMPACT CASSETTE RECORDER

Edgard R. Wiklund, Atlanta, Ga., assignor to Robert N. Fink, Decatur, Ga.

Continuation-in-part of application Ser. No. 789,155, Jan. 6, 1969. This application Feb. 3, 1969, Ser. No. 795,931
Int. Cl. G11b 5/02, 15/60
U.S. Cl. 179—100.2 D 7 Claims



The combination with a compact cassette-type tape recorder of a snap-on readily removable permanent magnet erasing member which fits between the removable cartridge and the inside wall of the cassette cavity of the recorder for erasing the magnetic tape when the tape is rewound. The erasing member has two longitudinally spaced, transversely disposed magnets on a flat carrier and longitudinally and transversely spaced detents for projecting through windows in the cassette so that the erase member may be snapped onto the cassette.

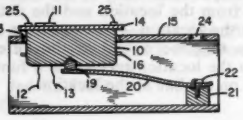
3,612,775
MAGNETIC TRANSDUCING HEAD ASSEMBLY WITH HEAD LEVEL ADJUSTMENT

Robert J. Miller, Salford, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Filed July 16, 1969, Ser. No. 842,270
Int. Cl. G11b 21/24, 21/20, 5/60
U.S. Cl. 179—100.2 P 5 Claims

A so-called "flying head" structure is disclosed which in-

cludes a hollow housing member into which a head block is fitted. A flexure spring contained within the housing urges



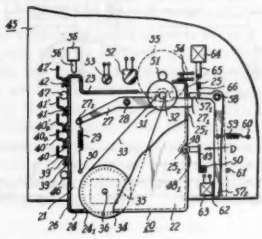
the head block away from the housing toward the recording medium.

3,612,776

RADIO CARTRIDGE WITH AUTOMATIC TUNING DEVICE FOR USE WITH MAGNETIC TAPE CARTRIDGE PLAYER

Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo-to, Japan

Filed Feb. 6, 1969, Ser. No. 797,092
Int. Cl. G11b *31/00;* **H04b** *1/32;* **H03j** *3/00*
U.S. Cl. 179—100.11 **9 Claims**



A radio cartridge with a radio receiving circuit for use with a player unit for an endless magnetic tape cartridge. The radio cartridge includes a lever rotatably mounted within a casing, and a pinch roller rotatably mounted on the lever. The pinch roller is moved by the swingable lever to abut against a capstan which is provided within the player unit, and is rotated by the capstan. Rotation of the pinch roller is imparted to an operating shaft of a tuning element in the radio receiving circuit to vary the radio receiving frequency. The lever is swung in such a direction to move the pinch roller away from the capstan when the radio is tuned to the radio wave so that rotation of the operating shaft is terminated and the radio is automatically tuned.

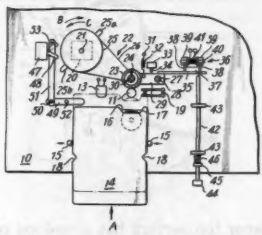
3,612,777

AUTOMATIC TUNING APPARATUS FOR MAGNETIC TAPE PLAYING SYSTEM HAVING A RADIO RECEIVER

Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo-to, Japan

Filed May 14, 1969, Ser. No. 824,650
Claims priority, application Japan, May 15, 1968, Sept. 30, 1968, 43/32222;43/84214
Int. Cl. G11b *31/00;* **H04b** *1/32;* **H03j** *3/00*
U.S. Cl. 175—100.11 **5 Claims**

An automatic tuning apparatus in a magnetic tape playing system with radio receiver, the system having a tape driving device including a driving capstan, a tape recording-reproducing circuit including a magnetic head, a radio receiving circuit including a tuning element, such as a variable condenser. The automatic tuning apparatus comprises a transmission device for imparting rotation of a capstan to the operating shaft of the tuning element, a device for latching the transmission device in the position where the latter is coupled to the capstan, and a sensing circuit for producing an electrical signal in response to sensing that the radio receiving circuit is tuned to the broadcasting radio wave, the transmission device being unlatched in response to the elec-



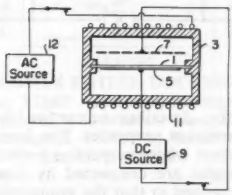
trical signal so that the tuning element is automatically set to the position tuning to the broadcasting radio wave.

3,612,778

ELECTRET ACOUSTIC TRANSDUCER AND METHOD OF MAKING

Preston V. Murphy, Weston, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Continuation-in-part of application Ser. No. 638,463, May 15, 1967, now abandoned. This application Apr. 3, 1970, Ser. No. 25,539
Int. Cl. H04r *23/00*
U.S. Cl. 179—111 **20 Claims**



A method of making electrets, comprising the steps of (1) internal polarization of a selected thermoplastic using an ionized gas, to contact one surface and serve as one electrode while a metal film serves as a second electrode, and applying a constant electric bias while the material is heated to a softened condition and then gradually cooled, and (2) by a secondary process, applying an electrostatic charge to the exposed dielectric surface of the electret.

An electroacoustic transducer is described in which at least one of the electrodes is fixed to an electret, the electret electrode combination serving either as the diaphragm or the backplate of the transducer. The diaphragm is imperforate and the backplate is perforated. An elevated spacer on the backplate contacts the diaphragm at regular intervals to prevent sticking and to control the acoustic response and in such a way as to form a multitude of similar individual transducer cells in parallel.

3,612,779

TELEPHONE REST

Bernice Frankowski, 1939 Lucina Ave., Pittsburgh, Pa.

Filed July 29, 1969, Ser. No. 845,777
Int. Cl. H04m *1/05*
U.S. Cl. 179—157 **8 Claims**

A one-piece rest for a telephone handset primarily but not necessarily designed and uniquely adapted for use by a bedridden patient who is either unable or not permitted to use her hands and arms. It comprises a foam rubber or an

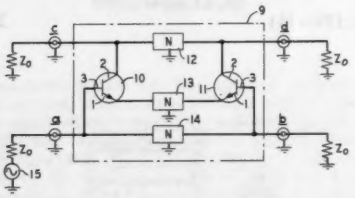
equivalent blocklike pad whose planar bottom side has a pair of depending shoulder straddling legs or brackets and whose

generally planar top surface has a molded recess for reception and properly poised retention of the ready-to-use handset.

3,612,780
ACTIVE FOUR-PORT

Henry R. Beurrier, Chester Township, Morris County, and Harold Seidel, Warren, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 8, 1969, Ser. No. 864,695
Int. Cl. H03f 3/62
U.S. Cl. 179—170 T **10 Claims**

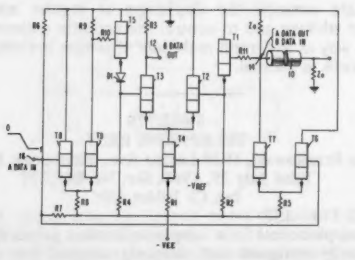


This application describes an active four-port having directional transmission properties. The four-port comprises two active members whose respective emitting, control and collecting electrodes are connected by means of separate networks characterized in that the symmetric mode transfer gain and the antisymmetric mode transfer gain, as measured between the control and collecting electrodes, are equal.

3,612,781
SIMULTANEOUS BIDIRECTIONAL TRANSMISSION SYSTEM

Donald J. Da Costa, Wappingers Falls, N.Y.; Robert Y. Noguchi, Framingham, Mass., and Leonard F. Winter, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 24, 1969, Ser. No. 844,528
Int. Cl. H04m 1/58
U.S. Cl. 179—170 NC **2 Claims**

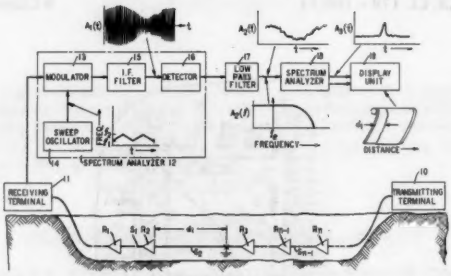


This specification describes a circuit which permits the simultaneous transmission of data in two directions on a common transmission line without the use of frequency or time discrimination. The circuit includes at each location a differential amplifier with two inputs, one input receives data to be transmitted onto the line from the particular location and the other input receives both the data being transmitted onto the line from the location and the data being received on the line at the location. The two inputs are isolated from each other so that the output of the differential amplifier which goes to the location receiver is a function only of the data received on the line at the location.

3,612,782
METHOD AND APPARATUS FOR DETECTING THE LOCATION OF A FAULT BETWEEN TWO REPEATERS OF A ONE-WAY REPEATERED TRANSMISSION LINE

George Wilfred Gilbert, Winston-Salem, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 2, 1970, Ser. No. 15,519
Int. Cl. H04b 3/46
U.S. Cl. 179—175.3 **12 Claims**

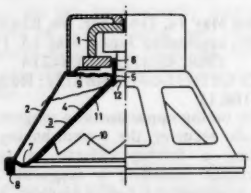


Noise generated at the input of a one-way repeater is reflected by a fault in a line segment connected to the input terminals of that repeater. Double spectrum analysis of the repeater output (which is part of the output of a receiving station when the repeater and line segment are a part of a one-way repeatered transmission line) recovers information relating to the distance of the fault from the repeater.

3,612,783
FOAM DIAPHRAGM FOR LOUDSPEAKER

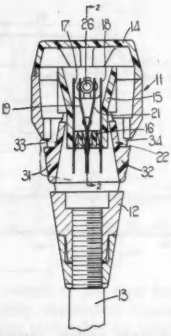
Kuno Schneider, Vienna, Austria, assignor to U. S. Philips Corporation, New York, N.Y.

Filed July 1, 1968, Ser. No. 741,411
Claims priority, application Austria, July 5, 1967, A 6244/67
Int. Cl. H04r 7/06
U.S. Cl. 179—181 F **5 Claims**



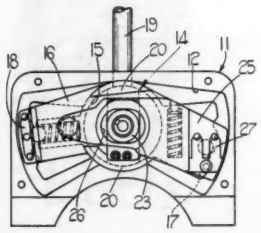
An acoustic converter formed as a foam membrane with its neck, cone, centering ring, and peripheral zone sectors made of different foam constituents with different mechanical and acoustical properties.

3,612,784
MULTIPLE CIRCUIT CONTROL SWITCH WITH IMPROVED PIVOTABLE OPERATING MEANS
Edward Cryer, Higham, near Burnley, Lancashire, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed Nov. 5, 1969, Ser. No. 874,254
Claims priority, application Great Britain, Nov. 18, 1968, 54549
Int. Cl. H01h *9/00, 19/00*
U.S. Cl. 200—1 TK 6 Claims



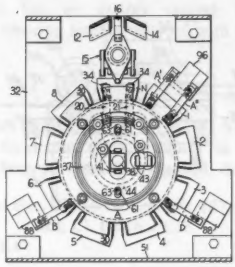
An electrical switch includes a body having a hollow portion closed at one end by a cover and an operating member mounted within the body for pivotal movement relative to the body. The switch further includes two sets of electrical contacts within the body, the contacts being operable in response to pivotal movement of the operating member in opposite directions respectively from an intermediate position. The operating member has a pair of oppositely directed fingers, the fingers extending within respective apertures in the hollow portion of the body.

3,612,785
ELECTRICAL SWITCHES WITH ACTUATING AND LOCATING PARTS MOVABLE INDEPENDENTLY OR CONCURRENTLY
John Granville Baldwin, Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed Dec. 3, 1969, Ser. No. 881,940
Claims priority, application Great Britain, Dec. 6, 1968, 58157/68
Int. Cl. H01h *25/06*
U.S. Cl. 200—4 1 Claim



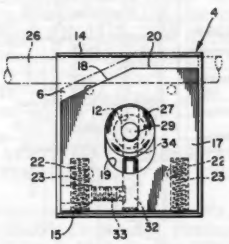
In an electrical switch an operating member is coupled to an operating lever and is movable by the operating lever from an inoperative position to at least one operative position in which a circuit between a pair of terminals on the switch is completed. The operating lever is also movable in a different plane against the action of resilient means, from an inoperative position to a position it causes the same circuit to be completed. This is accomplished by using an operating member in two parts, one of which carries the switch contacts and the other of which locates relative to the switch housing, so that the part of the contact member carrying the contacts can be moved independently of the other part.

3,612,786
LOAD TAP CHANGING APPARATUS
Carl G. Whitman, Mukwonago, Wis., assignor to Allis-Chalmers Mannufacturing Company, Milwaukee, Wis.
Filed Nov. 9, 1970, Ser. No. 87,752
Int. Cl. H01h *21/78*; G05f *1/20*
U.S. Cl. 200—11 TC 23 Claims



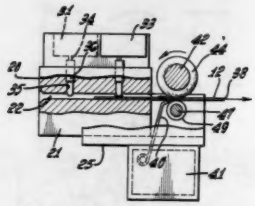
The rotatable contact carrier of a tap changer dial switch carries both tap changer movable contacts and an odd-even switch conductive plate having a plurality of arcuately spaced radial projections which engage first and second finger contacts to form first and second normally closed pairs of contacts connected in series with the tap changer first and second movable contacts respectively. Each time the contact carrier is rotated to accomplish a tap change, one contact finger falls between adjacent radial projections on the conductive switchplate to open the pair of contacts in series with the corresponding movable tap changer contact before the movable tap changer contact disengages a stationary tap changer contact and engages a succeeding radial projection to reclose the pair of contacts after the movable tap changer contact engages the succeeding stationary tap changer contact.

3,612,787
SAFETY POWER SWITCH LOCKING DEVICE
David F. Hlavsa, 17868 Ash Drive, Strongsville, Ohio, and Dennis M. Kedziora, 7382 Meadow Lane, Seven Hills, Ohio
Filed Aug. 21, 1969, Ser. No. 851,924
Int. Cl. H01h *9/28*
U.S. Cl. 200—44 2 Claims



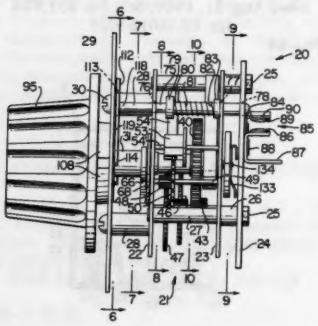
A safety power switch locking device for adjustable power machinery utilizing a tool for making such adjustments, such as power machinery having manually operated chucks and wrenches for manually operating such chucks; the device comprised of a housing for mounting over the power switch of the power machine, an elongated tumbler or other actuating lever for such switch extending into the housing together with a keyed spring-biased block or the like in said housing, said block biased toward a lock position, such lock position characterized in that the key portion of said block extends into a key receiving aperture in the power switch tumbler when in the power-off position and prevents movement of the tumbler to its power-on position, the keyed block movable to an unlock position in response to insertion of the chuck wrench into the housing through an aperture specially designed to accommodate the chuck wrench.

3,612,788
CARD ACTUATED SWITCH COMBINATION
Clarence L. Ellefson, Burbank, Calif., assignor to Park-O-Matic Mfg., Inc., Burbank, Calif.
Filed Dec. 3, 1969, Ser. No. 881,827
Int. Cl. H01h 43/08
U.S. Cl. 200—46 7 Claims



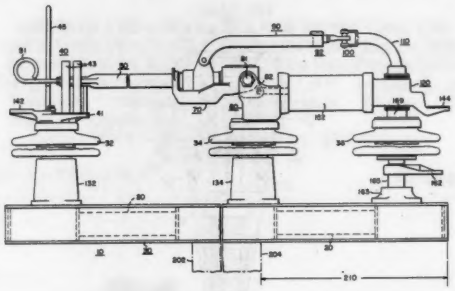
A card initiated actuator comprising a combination of switches preset at either closed or open position for causing operation of a selected actuator when switch positions are reversed by projections on a card acting on respective moving pin tumblers. A switch arm at the exit end of a card slot is tripped by pushing a card against it thereby to start an electric motor which rotates a pair of rollers between which the card is thereby drawn. A second pair of rollers receive the card from the first pair of rollers and mutilate it so that it cannot again be used, before passing it to a collecting box.

3,612,789
MANUAL CONTROL DEVICE FOR SWITCHES AND TIMERS
Edgar E. Marquis, Newtown, and Emil Niemand, Waterbury, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.
Filed Feb. 24, 1969, Ser. No. 801,559
Int. Cl. H01h 3/00
U.S. Cl. 200—17 R 10 Claims



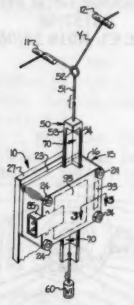
A control device for actuating an actuator for a predetermined period of time by the turning of a control knob to a selected time period and, thereafter, initiating the running of the time period by depressing a pushbutton member, or for providing a continuous actuation of the actuator by setting the control knob in a continuous on manual position thereof, or for providing momentary manual actuation of the actuator by manually depressing the pushbutton member when the control knob is set in its off position, the control device having a latch member which in one position thereof latches the timer motor from operating and in another position thereof unlatches the timer motor while latching a plunger operator for the actuator in its actuating position in both the time-operated condition of the control device and the continuous on condition thereof.

3,612,790
HIGH-VOLTAGE ELECTRIC SWITCH HAVING IMPROVED SUPPORTING BASE
Edmund W. Kuhn, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Dec. 23, 1969, Ser. No. 887,498
Int. Cl. H01h 31/00
U.S. Cl. 200—48 8 Claims



A high-voltage electric switch comprising a plurality of spaced insulator stacks having a switch blade movably supported thereon and a contact jaw supported on one of the other insulator stacks and disposed in the path of movement of the switch blade. The insulator stacks are mounted on a common supporting base which includes a pair of generally parallel channel members and a pair of reinforcing members disposed between said channel members and spaced from the ends of said channel members.

3,612,791
YARN TENSION AND BREAK DETECTOR APPARATUS
William D. Porter, and Bert B. Morgan, both of Asheville, N.C., assignors to Northrop Carolina, Inc., Asheville, N.C.
Filed Jan. 13, 1970, Ser. No. 2,456
Int. Cl. B65h 25/14
U.S. Cl. 200—61.18 14 Claims

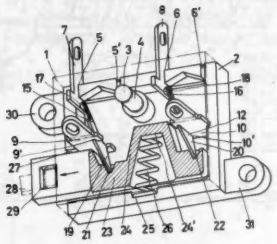


An apparatus for detecting variations in tension and occurrences of breaks in a yarn traveling along a predetermined path including magnetically actuatable switch means having an open position and a closed position and being biased toward an open position and magnet means for magnetically influencing and normally maintaining the switch means in a closed position against its bias. Magnetic shunt means is carried by a yarn engaging means which moves under the influence of the yarn upon variations in tension and occurrences of a break in the yarn to move the shunt means into a position for shunting the influence of the magnet means on the switch means so that the switch means will shift under its bias to an open position.

3,612,792
DOUBLE-POLE SLIDE SWITCH

Rudolf Hinkelmann, Bad Neustadt, Germany, assignor to PREH Electro-Feinmechanische Werke, Jakob Preh Nachf, Bad Neustadt/Saale, Germany

Filed Jan. 27, 1970, Ser. No. 6,149
Claims priority, application Germany, Feb. 28, 1969, P 19 10 165.6
Int. Cl. H01h *13/28*
U.S. Cl. 200—67 A 7 Claims

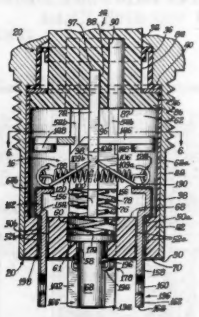


Double-pole slide switch of the type having a switch slide, a housing and pivotally supported contact elements which are snap-action-fashion reversible by operation of the switch slide, said switch having double-armed contact elements pivotally supported in stationary connecting elements, a first arm of each contact element cooperating with stationary counter-contacts and a second arm of each contact element engaging a recess of the switch slide, there being provided a compression spring between a pot-shaped middle portion of the slide and a stationary part of the switch housing, said spring constituting a power storage for the snap-action operation of a switch.

3,612,793
ELECTRICAL SWITCH COMPONENTS AND SWITCHES FORMED THEREBY

John O. Roeser, Arlington Heights, Ill., assignor to Otto Engineering, Inc., Carpentersville, Ill.

Filed Nov. 25, 1968, Ser. No. 778,626
Int. Cl. H01h *13/28*
U.S. Cl. 200—67 B 20 Claims

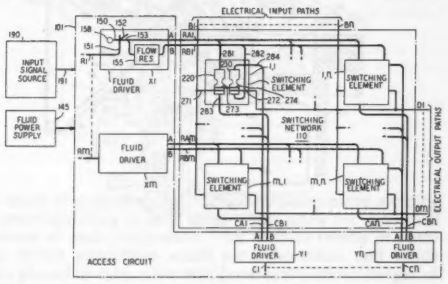


This invention relates to electrical switch components for snap action mechanisms particularly of the butterfly type and utilizes a second class lever system wherein the tension spring is attached outboard of the contact portions to an integral shear formed attachment strut to afford large movement differential, high leverage contact forces and stability. The integral attachment strut means for the one piece switchblade and contact member is reversely curved for mechanical wear properties in attachment of the end of the tension spring and is proportioned and located for maintenance of dimensional stability to the curved spaced contact portions. There is use of the space intermediate the contacts for location and attachment of the tension member, the contacts being spaced portions of the end of the switchblade which is of a generally cylindrical form. The switches also have a "rolling sleeve" sealing means, dual use of the terminal slot for mounting and as a rotation preventing keyway and also a common terminal means is resiliently mounted in situ in a manner to form an open sided solder pot. The two pole four circuit version of the mechanism has an energy storing resilient donut mechanism for assuring simultaneity of both sets of bridging contacts.

3,612,794
FLUID CONTROLLED SWITCHING NETWORK

Harry Winter, Granville, Ohio, assignor to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 22, 1969, Ser. No. 887,106
Int. Cl. H01h *29/28*
U.S. Cl. 200—81.6 8 Claims

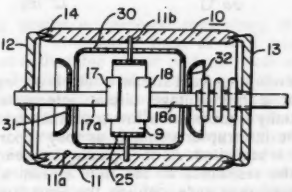


A coordinate array of fluid-pressure-operated, metallic-contact switching devices are interconnected to provide destructive mark switching operation. Each crosspoint of the array includes two such switching devices with the contacts thereof electrically connected in series. Two sets of row and column fluid channels are arranged such that a fluid pulse on a row or column channel of one set releases at least one switching device at each crosspoint connected to the row or column. Coincident fluid pulses on a row channel and a column column channel of the other set operates both switching devices at a selected crosspoint Destructive mark operation is achieved by timing or pressure differential between the fluid pulses on the two sets of row and column channels.

3,612,795
SHIELDING ARRANGEMENTS FOR VACUUM-TYPE CIRCUIT INTERRUPTERS OF THE TWO-CONTACT TYPE

Werner S. Emmerich, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 9, 1969, Ser. No. 789,981
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B 7 Claims



A vacuum-type circuit interrupter of the two-contact type is provided with a short shield for preventing the deposition

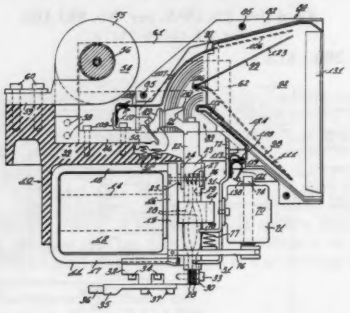
of metallic vapor from the arcing region upon the inner surfaces of the outer insulating casing of the vacuum-type circuit interrupter. For certain applications, the shield is made of considerable thickness to enable it to withstand the heavy arcing, which may occur thereat. In addition, for other applications, the short shield may be formed of an electrode-type material so that arcing may occur without damage to the shield.

3,612,796

INTERLOCK BETWEEN CONTACTOR AND ARC CHUTE

Gustav W. Doos, Milwaukee, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Aug. 6, 1969, Ser. No. 847,877
Int. Cl. H01h *33/46*
U.S. Cl. 200—144 **1 Claim**



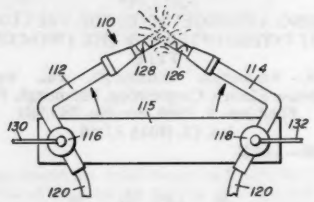
A circuit maker and breaker has a removable arc chute for interrupting an arc formed between the movable and stationary contacts and interlock means to prevent operation of the contacts when the arc chute is removed to thereby prevent damage to the contacts.

3,612,797

HIGH-VOLTAGE FLUIDIC CIRCUIT INTERRUPTER

Wallace L. Boling, deceased, late of Vancouver, Wash. (by Dorothea M. Boling, legal representative), and Allen L. Kinyon, Vancouver, Wash., assignors to The United States of America as represented by the Secretary of the Interior

Filed Sept. 22, 1969, Ser. No. 862,999
Int. Cl. H01h *33/75*
U.S. Cl. 200—144 AP **7 Claims**



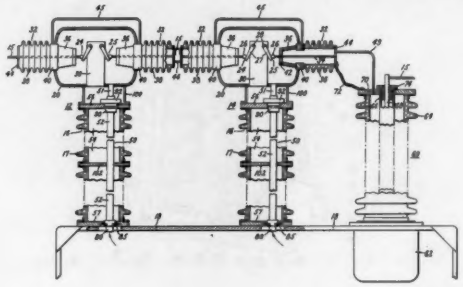
A semiconducting fluid stream controls arcing between the contacts of a high-voltage circuit interrupter. The fluid stream initially establishes a low-resistance conducting path between the interrupter contacts as they separate when the interrupter is activated. As the spacing between the contacts increases the resistance of the fluid stream also increases. The increased resistance reduces the load current to a low level at which circuit interruption is accomplished without significant arcing. The semiconducting fluid also extinguishes any arc which forms as the interrupter contacts separate.

3,612,798

AIRBLAST CIRCUIT BREAKER WITH IMPROVED SEALING MEANS

Robert S. Barton, Bryn Mawr, and John A. Oppel, Aldan, both of Pa., assignors to General Electric Company

Filed Mar. 2, 1970, Ser. No. 15,631
Int. Cl. H01h *33/82*
U.S. Cl. 200—148 R **5 Claims**



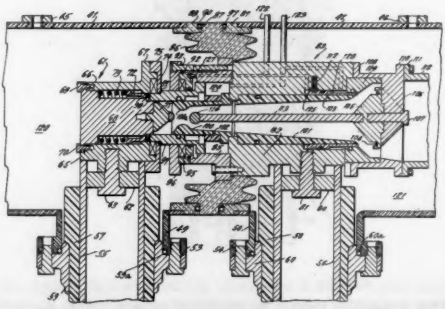
Discloses an airblast circuit breaker comprising interrupter tanks at high voltage filled with high-pressure air and provided with terminal bushings filled with a dielectric gas other than air. The tanks are mounted on hollow insulating columns through which air lines of insulating material extend to supply high-pressure air to the tanks. A current transformer adjacent the columns has an insulating housing that is pneumatically interconnected with the bushings in the high-voltage region and is filled with dielectric gas of the same type as the bushings to serve as a reservoir for supplying the bushings with dielectric gas. Also discloses special means for mounting and sealing the high-pressure air line with respect to its column and tank.

3,612,799

GAS BLAST CIRCUIT INTERRUPTER USING MAIN MOVABLE CONTACT AS BLAST VALVE

William A. Carter, Devon, Pa., and Hansruedi Aumayer, Suhr, Switzerland, assignors to I-T-E Imperial Corporation, Philadelphia, Pa.

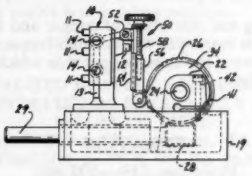
Filed May 8, 1969, Ser. No. 823,116
Int. Cl. H01h *33/86, 33/70*
U.S. Cl. 200—148 R **3 Claims**



A high-speed gas blast circuit breaker in which SF_6 is used as the mechanical drive for the movable contact and as the dielectric medium for maintaining a high dielectric between the open contacts and for extinguishing arcs. Two or three movable elements are used; an annular movable contact and a cutoff valve and, in some cases, a follower contact. The two elements may be incorporated into one movable body. Each of the movable elements have radially extending surfaces defining pistons so that they may be moved by control air

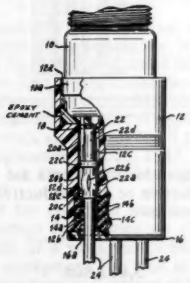
pressure. The movable contact serves as an annular seal in a barrier which separates a high-pressure region from a low-pressure region when the contact is closed. The movable contact acts in the manner of a cork so that, when the seal is broken, the contact is accelerated toward its open position, and fluid from the high-pressure side flows through the annular gap formed and through the arc in its passage to the low-pressure side. The apparatus is mounted in a suitable switch gear enclosure.

3,612,800
SWITCH WITH ADJUSTABLE SWITCH ACTUATOR
Robert E. Slopa, 4615 Dean St., Woodstock, Ill.
Filed Apr. 24, 1970, Ser. No. 31,504
Int. Cl. H01h *3/00*
U.S. Cl. 200—153 T **15 Claims**



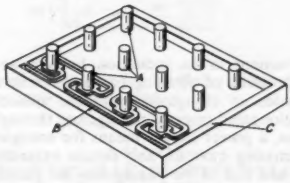
A plurality of rotary cams are mounted on a rotatable shaft. The position of each cam relative to the shaft is selectively adjustable to the nearest 30° by means of a positioning pin engageable with any of 12 openings in the cam. A plurality of switches are mounted on a frame structure in spaced relation to their respective cams. A three-piece switch actuator is pivotally mounted on the frame adjacent the switch. A screw element of the actuator selectively adjusts a slidable element in a direction generally tangential to the cam to provide selective adjustment of actuation of the switch throughout about 30°. The mechanism is, therefore, completely adjustable throughout 360°

3,612,801
CONTACT PIN WIRE TERMINATION ADAPTOR ASSEMBLY FOR ELECTRIC SWITCHES
James L. Elliott, Santa Ana, Calif., and Harold W. Hults, New Berlin, Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed June 23, 1970, Ser. No. 49,121
Int. Cl. H01h *9/04*
U.S. Cl. 200—168 G **4 Claims**



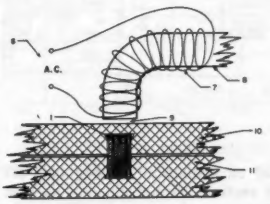
A toggle switch and assembly for effecting connection of wire leads with contact pin terminations to exterior switch terminals is disclosed. A portion of the switch housing adjacent the terminals is mounted and sealed in one end of an insulating base with the terminals engaging separate connector receptacles within individual bores with the base. The wire contact pins are held in locked electrical engagement with respective switch terminals and connector receptacles within the base, and the wires connected thereto are sealed against moisture by a grommet member sealed within the opposite end of the base. The connector receptacles are of a design accepting several different sizes and styles of standard contact pin wire terminations.

3,612,802
PUSHBUTTON ARRAY
Anthony Crisp Beadle, New Barnet, and George Owen Foot, Hertford, both of England, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Sept. 19, 1969, Ser. No. 859,320
Claims priority, application Great Britain, Sept. 23, 1968, 45089/68
Int. Cl. H01h *3/12*
U.S. Cl. 200—172 R **4 Claims**



An array of pushbuttons is formed as a one-piece molding with interconnecting flexible strips which allow for individual movement of each pushbutton. This process results in pushbutton switch assemblies which are economical and which may be placed in subscriber telephone sets without danger of misplacement of individual pushbuttons.

3,612,803
FASTENING DEVICE
Ruth Elizabeth Barry Klaas, 10 Oriole Drive, Wyomissing, Pa.
Continuation-in-part of application Ser. No. 454,299, May 10, 1965, now abandoned. This application Feb. 29, 1968, Ser. No. 709,493
Int. Cl. H05b *13/02, 9/02*
U.S. Cl. 219—10.53 **19 Claims**

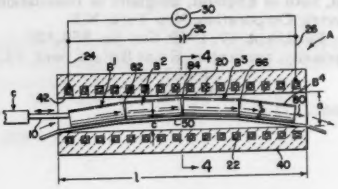


A fastening device is disclosed comprising at least one closed electrically conductive loop at least partially embedded in heat-activatable plastic material, activation of the plastic material being effected at an appropriate time by inducing alternating electrical current, in at least one closed electrically conductive loop in the fastening device, by means of a solenoid coil energized by alternating electrical current. The fastening device optionally may contain a ferromagnetic core enclosed within at least one electrically conductive loop and insulated therefrom, and the heat-activatable plastic material optionally may contain blowing agent. A method of adhering solid objects together by use of a fastening device of this type is also disclosed.

3,612,804
INDUCTION HEATING DEVICE FOR SUCCESSIVE BARLIKE MEMBERS

Norbert R. Balzer, Parma, Ohio, assignor to U.S. Atomic Energy Commission

Filed Dec. 31, 1968, Ser. No. 788,269
Int. Cl. H05b 5/00; H05b 9/02
U.S. Cl. 219—10.69 10 Claims

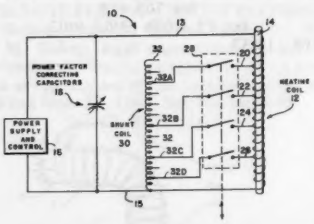


An improvement in an induction heating apparatus for heating a succession of abutting barlike members which apparatus includes an elongated multiturn induction heating coil with an elongated internal passageway through which the members pass, a power supply means for energizing the coil with an alternating current, and means extending between the entrance and exit of the passageway for guiding members through the passageway on a selected path. The improvement comprises forming the guide means with an elongated element with a contoured portion between the entrance and exit of the passageway which contoured portion creates a gradual offset in a selected transverse direction to the path so that the members do not pass through the coil with their abutting ends in full contact with each other.

3,612,805
INDUCTIVE HEATING-COOLING APPARATUS AND METHOD

Theodore R. Kennedy, Willingboro, N.J., assignor to Inductotherm Corporation, Rancocas, N.J.

Filed Apr. 27, 1970, Ser. No. 31,919
Int. Cl. H05b 5/00, 9/06
U.S. Cl. 219—10.75 3 Claims



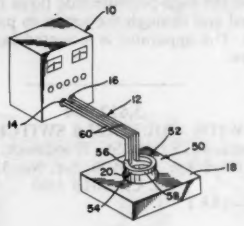
Sections of an induction heating coil are connected in parallel with sections of a shunt coil so that the section to section impedance of the unit differs. Accordingly, the amount of heat power applied to sections of a metal object by the heating coil is varied according to a predetermined pattern. Electric power applied to the entire shunt coil and heating coil unit is lowered over a period of time to cool the metal object progressively along a geometrical axis.

3,612,806
INDUCTOR FOR INTERNAL HEATING

John C. Lewis, and Wentworth Hamilton, both of Ontario, Canada, assignors to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Feb. 26, 1970, Ser. No. 14,544
Int. Cl. H05p 5/00, 9/02
U.S. Cl. 219—10.79 1 Claim

An inductor for internal induction heating wherein the outer working surface only is made of a high electrically conductive material, and the remainder thereof defining a water-cooling passage is made of a less conductive material so that high-frequency electrical current must flow in the working surface which is closely adjacent to the surface to be heated.



A conduit having one side made of copper and all other sides made of plastic is employed so that high-frequency electrical current is concentrated in the copper side which functions as the working surface.

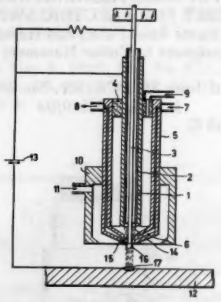
ERRATUM

For Class 219—105 see:
Patent Nos. 3,613,106 and 3,613,107

3,612,807
METHOD OF AND DEVICE FOR PLASMA ARC WELDING

Adrianus Christinus Henricus Jozef Liefkens, and Wilhelmus Gerardus Essers, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,025
Claims priority, application Netherlands, Jan. 3, 1969, Apr. 4, 1969, 6900167;6905350
Int. Cl. B23k 9/00
U.S. Cl. 219—121 P 17 Claims



A method and apparatus for plasma arc welding in which an electrically conductive or nonconductive filler wire is fed axially into the plasma arc.

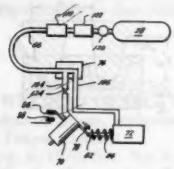
3,612,808
SHIELDING GAS PRESSURE ACTUATED PIPE-WELDING DEVICE

Jerome W. Nelson, and Travis Howell, Jr., both of Houston, Tex., assignors to CRC-Crose International, Inc., Houston, Tex.

Filed June 4, 1969, Ser. No. 830,479
Int. Cl. B23k 9/02
U.S. Cl. 219—60 A 13 Claims

An internal pipe-welding device having a carriage, an internal pipe clamp, a rotating welding nozzle which is pivotally mounted and biased away from its welding position, a pressure responsive means connected to the welding nozzle

and adapted to move the welding nozzle to welding position responsive to the supply of shielding gas through a single service lead supplying the welding potential, the motive power

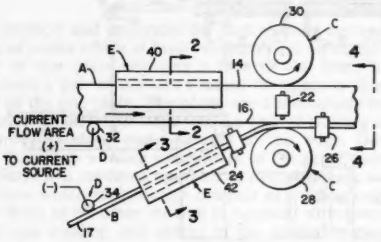


for feeding electrode and the shielding gas. The pivoting of the welding nozzle also pivots a contact button which makes contact to supply electricity for welding to the welding nozzle only when the nozzle is in welding position.

3,612,809
LOCALIZED HEATING WITH CURRENT CONCENTRATED BY EXTERNALLY APPLIED MAGNETIC FIELD

Glenn R. Mohr, P. O. Box 52, Linthicum, Md.

Filed Mar. 5, 1970, Ser. No. 16,874
Int. Cl. B23k *31/06*
U.S. Cl. 219—67 9 Claims



Heating of a solid conductor is caused by passing DC or low-frequency AC current through the conductor and restricting the current flow path by an externally applied magnetic field.

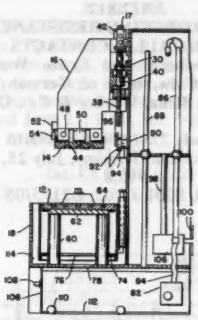
3,612,810
MOVABLE DIELECTRIC TANK FOR ELECTROEROSIVE MACHINES

Thomas J. O'Connor, 100 Morgan Road, Ann Arbor, Mich.

Continuation-in-part of application Ser. No. 696,195, Jan. 8, 1968, now Patent No. 3,485,991, dated Dec. 23, 1969, which is a continuation-in-part of application Ser. No. 504,971, Oct. 24, 1965, now Patent No. 3,363,083, dated Jan. 9, 1968, which is a continuation-in-part of application Ser. No. 250,321, Jan. 9, 1963, now Patent No. 3,222,494, dated Dec. 7, 1965. This application Dec. 23, 1969, Ser. No. 887,795
Int. Cl. B23p *1/04, 1/08*
U.S. Cl. 219—69 D 8 Claims

A machine tool for electrical machining is disclosed including a ram portion for moving an electrode supported thereby transversely of a workpiece while moving the electrode toward the workpiece. The ram is moved toward the workpiece in the machine tool disclosed by a screw and nut mechanism driven by a rotary hydraulic motor.

The machine tool further includes a stationary table for supporting a workpiece and a movable dielectric work tank having an opening in the bottom thereof operable in conjunction with the table to provide a sealed tank in one position thereof and to permit rapid draining of dielectric through the bottom of the tank on downward movement of the tank relative to the table whereby the workpiece and table are exposed for inspection. A system is also disclosed for supplying clean dielectric to the work tank for pumping dielectric from the work tank to a storage tank and for pumping the dielectric from the storage tank through a filter back to the work tank or back to the storage tank. The dielectric system also

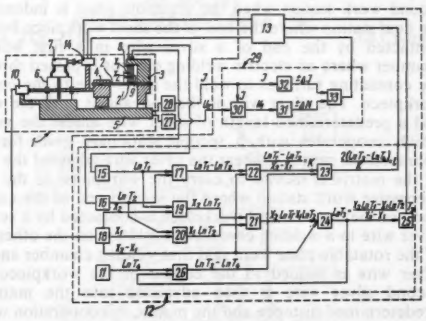


includes a removable tray for receiving contaminated electrolyte to be cleaned or disposed of.

3,612,811
METHOD OF THE ELECTRIC BUTT WELDING OF WORKPIECES

Viktor Senderovich Lifshits, Kavkazsky bulver, 21, korpus 2, kv. 41, Moscow; Violetta Pavlovna Guseva, 13 Parkovaya, 16, korpus 4, kv. 57, Moscow; Vadim Petrovich Krivonos, ulitsa Repina, 13, kv. 1, Kiev; Nikolai Vasilievich Podola, ulitsa Pushkinskaya, 8, kv. 12, Kiev; Alexandr Semenovich Falkevich, deceased, late of Moscow; Valentina Pavlovna Falkevich, administrator, 5 Parkovaya ulitsa, 52, kv. 31, Moscow (of said Alexandr Semenovich Falkevich, deceased); Sergei Alexandrovich Falkevich, administrator, Golyanovo, korpus 46, kv. 75, Moscow (of said Alexandr Semenovich Falkevich, deceased), and Boris Alexandrovich Falkevich, administrator, 5 Parkovaya ulitsa, 52, kv. 31, Moscow, all of U.S.S.R. (of said Alexandr Semenovich Falkevich, deceased)

Filed Apr. 25, 1969, Ser. No. 821,166
Int. Cl. B23k *11/02*
U.S. Cl. 219—100 1 Claim



A method of effecting electrical butt welding of workpieces by continuously flashing the ends of the workpieces to be welded to a temperature within 0.7 to 1.0 of the melting point of the workpiece material and with a variation during the welding process of the flashing rate followed by upsetting; the extremal value of the power evolving in the workpieces to be welded being maintained in the course of the flashing process, whereas upsetting is effected to a value responsive to the distance between sections of the workpieces at a predetermined heating temperature depending on the properties of the workpiece material. An apparatus for carrying into effect the said method comprises a welding machine and a device for controlling the processes of flash-

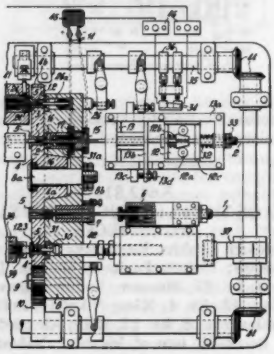
ing and upsetting, provided with two channels for controlling the welding process.

3,612,812

MACHINE FOR PRODUCING RESISTANCE WELDED TRIMETALLIC CONTACTS

Hans Wacker, Heidelberg, and Erwin Wolfinger, Oberreichenbach uber Calw, both of Germany, assignors to Firma Kettenfabrik Renz, Wacker & Co., Calmbach, Germany

Filed July 27, 1970, Ser. 58,616
Claims priority, application Germany, July 25, 1969, P 19 37 915.8
Int. Cl. B23k *11/02*; B21j *5/08*
U.S. Cl. 219—107 10 Claims



A machine for making trimetal contacts having a body of relatively low cost metal, such as copper, and contact surfaces of an expensive metal such as silver, the machine including a plate rotatable in a vertical plane carrying a plurality of matrices spaced equally about its circumference, and means to position each matrix successively to a plurality of work stations, a first work station to receive the end of a copper wire to a predetermined depth in the matrix at that work station, the matrix cooperating with a first stationary guide-forming countershear means through which the copper wire is fed, to shear the end of the copper wire to form the body of a workpiece, and to carry the severed piece to a second work station when the rotatable plate is indexed to the next station where the end of the short workpiece body is contacted by the end of a silver wire in a first welding chamber where an electric welding current is passed through the contacting surfaces to weld the silver wire to the copper workpiece. The silver wire is then advanced until the weld, and a predetermined length of silver wire enters the matrix which cooperates with a second stationary guide-forming countershear means to shear the silver wire adjacent the weld as the matrix is moved to carry the workpiece to the next successive work station where the second end of the copper body of the now bimetal workpiece is contacted by a second silver wire in a welding chamber positioned on the other side of the rotatable plate from said first welding chamber and the silver wire is welded to the copper of the workpiece, the second silver wire is then advanced into the matrix a predetermined distance and the matrix, in cooperation with a third fixed guide, shears the second silver wire as the plate carries the workpiece forward to a final station where the now trimetal workpiece is simultaneously shaped by upsetting, and ejected from the matrix.

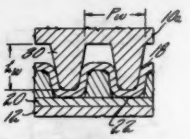
3,612,813

METHOD OF FORMING A LIGHTWEIGHT METAL SANDWICH HAVING A HONEYCOMB CORE

Francis C. Gerath, Canton, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Apr. 29, 1970, Ser. No.33,443
Int. Cl. B23k *11/06*
U.S. Cl. 219—117 HD 4 Claims

A sheet of honeycomb sandwich structure having flat exterior surfaces and internal cooling passages is constructed by the electric-resistance welding of outer sheets of flat metal to a center core of corrugated metal. The resistance welds are accomplished using electrically conductive shunt bars



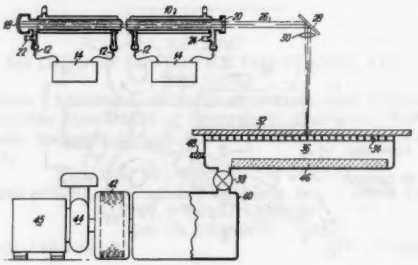
which have a contact area proportioned to provide a current density of sufficient intensity to cause a local heating and fusion between the corrugated metal and the flat metal sheet.

3,612,814

CUTTING PROCESSES EMPLOYING A LASER

Peter T. Houldcroft, Royston, England, assignor to National Research Development Corporation, London, England

Filed Jan. 6, 1970, Ser. No. 948
Claims priority, application Great Britain, Jan. 10, 1969, 1578/69
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 L 9 Claims



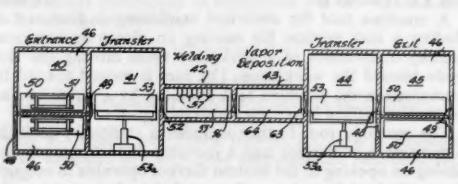
A workpiece is cut by causing a focused spot from a laser beam to travel over its surface and a suction chamber is located on the other side of the workpiece with an opening under the cutting location so that air or other gas is drawn through the cut into the suction chamber, taking with it fumes and products of distillation. The opening in the suction chamber may be a grid supporting the workpiece. For metal workpieces a gas having an exothermic reaction with the metal can be drawn through the cut.

3,612,815

ELECTRON BEAM APPARATUS

John F. Hinrichs, Menomonee Falls, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

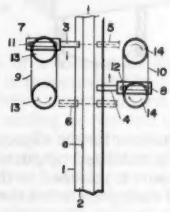
Division of Ser. No. 726,341, May 3, 1968, Pat. No. 3,535,489.
Filed Jan. 16, 1970, Ser. No. 3,268
Int. Cl. B23k *15/00*
U.S. Cl. 219—121 EB 2 Claims



The side member and crossmember of a vehicle frame are mounted in a fixture within a sealed welding chamber at a welding station and a plurality of electron welding guns are arranged along a weld line for simultaneous welding of the several components of the frame with the beams of the guns overlapping to provide an uninterrupted continuous weld. A

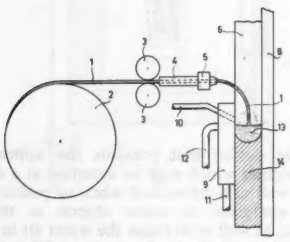
loading station and an unloading station is mounted to the opposite sides of the welding station and connected thereto by a vacuum lock transfer station. The welded frame is coated with a protective metal such as aluminum or zinc by passing the welded frame through a metal vapor-depositing chamber disposed immediately in-line following the welding chamber.

3,612,816
TACK WELDING OF SECTIONS
Masaaki Hano, Yokohama, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 6, 1970, Ser. No. 61,741
Claims priority, application Japan, Aug. 7, 1969, 44/62040
Int. Cl. B23k 9/12
U.S. Cl. 219—124 **9 Claims**



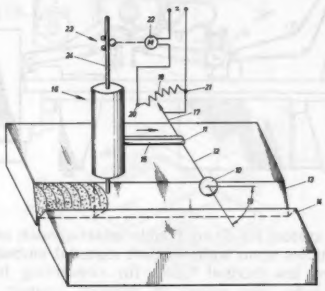
A method and apparatus for tack-welding sections in the form of plates where at least two plates are arranged with the edge of one plate engaging a face of the other to define therewith a pair of corners situated on opposite sides of the edge of the one plate. The plates are continuously fed in the direction of the latter edge while a pair of welding units are reciprocated along paths parallel to this edge. During the time that each welding unit moves in the same direction as the plates it is rendered operable to deposit a tack weld. The structure which reciprocates the pair of welding units maintains them at all times moving in opposed directions so that while one welding unit moves in the same direction as the plates from a given starting location to a given end location the other welding unit is returning from its end location back to its starting location. The speed with which each welding means is moved at least in the same direction as the plates is different from the speed of movement of the plates.

3,612,817
VERTICAL GAP ARC WELDING
Gerrit Willem Tichelaar; Johannes Gerardus Verhagen, and Gerardus Antonius Maria Willems, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 13, 1969, Ser. No. 876,537
Claims priority, application Netherlands, Nov. 16, 1968, 6816388
Int. Cl. B23k 9/12
U.S. Cl. 219—126 **4 Claims**



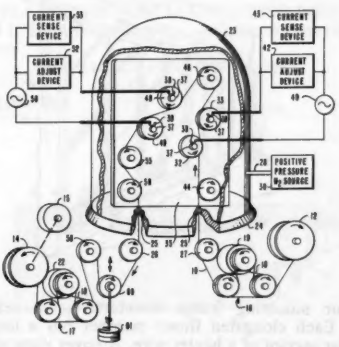
A method and a device for vertical electric arc welding, particularly in a narrow gap. The contact member is located outside the gap, and the welding wire is curved from its source to be directed substantially vertically into the molten pool.

3,612,818
WELDING CONTROL ARRANGEMENT
Richard Bechtle, Niederhochstadt, Taunus; Erich Bragard, Kelkheim, Taunus, and Gunther Hannappel, Frankfurt am Main, all of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany
Filed June 11, 1970, Ser. No. 45,323
Claims priority, application Germany, June 13, 1969, P 19 30 154.3
Int. Cl. B23k 9/12
U.S. Cl. 219—130 **10 Claims**



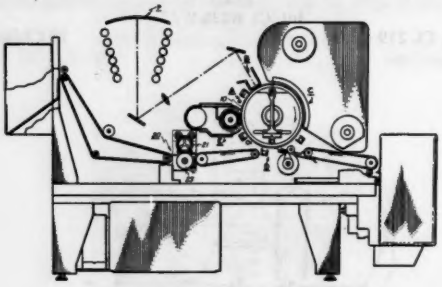
An apparatus for controlling the application of weld metal in electric calarc welding includes a mechanical scanning device upstream from the welding torch. The scanning device penetrates into the welding groove and measures at least one physical dimension thereof which is converted into signals for controlling the welding material feed.

3,612,819
APPARATUS FOR PREPARING HIGH MODULUS CARBONACEOUS MATERIALS
David W. Gibson, Long Beach, Calif., assignor to HITCO
Division of Ser. No. 617,187, Feb. 20, 1967, abandoned.
Filed Aug. 14, 1969, Ser. No. 866,781
No. 866,781
Int. Cl. C21d 9/62; H05b 1/00
U.S. Cl. 219—155 **10 Claims**



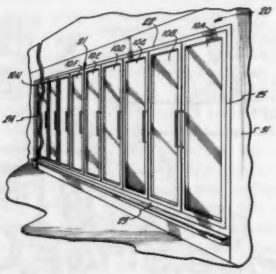
Apparatus for strengthening carbonaceous materials comprises at least one pair of electrically conductive electrode rollers, material supply and takeup means and electrode power supply means. The apparatus may also include a pair of preheat rollers and variable speed control means coupled to material supply and takeup means.

3,612,820
HEAT-FIXING APPARATUS FOR LENGTHY FUSIBLE MATERIAL
Frazier D. Punnett, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Dec. 12, 1969, Ser. No. 884,423
Int. Cl. H05b *1/00*
U.S. Cl. 219—216 1 Claim



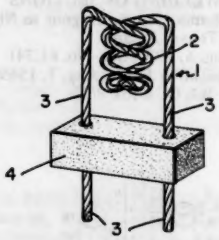
A fixing system for fixing fusible material such as electroscopic particles upon wide support material embodying the principle of low-thermal losses for conserving heat. The system includes two rollers in pressure contact between which the support material is transported. One of the rollers is heated from an interior lamp which remains fixed so that portions of the roller along its entire length are heated continuously and conducted to the side of the support material carrying the particles. The heated roller is driven externally by a plurality of roller members positioned at the ends thereof to enable heat losses to support fixtures to be minimized.

3,612,821
DOOR FRAME CONSTRUCTION
Michael E. Stromquist, Studio City, Calif., assignor to Anthony's Manufacturing Company, Inc., San Fernando, Calif.
Filed Nov. 16, 1970, Ser. No. 89,880
Int. Cl. H05b *1/00*
U.S. Cl. 219—218 9 Claims



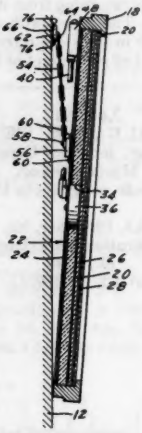
A door mounting frame structure for a refrigerated cabinet. Each elongated frame member has a longitudinal groove for receipt of a heater wire. A cover plate covers the heater wire groove and provides a surface for contact with a door-mounted gasket. One longitudinal edge of the cover plate is held in place by a longitudinal cover-plate-receiving groove formed in the frame member. The other longitudinal cover plate edge is secured by the covering head of a retainer strip. The strip has a foot portion adapted to be removably inserted in a longitudinal groove formed in the frame member.

3,612,822
EVAPORATION FILAMENT ASSEMBLY
Ronald E. Edin, Stratham, N.H., assignor to Sylvania Electric Products Inc.
Filed June 25, 1969, Ser. No. 836,289
Int. Cl. C23c *13/00*
U.S. Cl. 219—275 1 Claim



An evaporation filament for the vapor deposition of metallic films consists of a stabilized tungsten coil having parallel legs. A ceramic support is attached to the legs and prevents distortion of the coil during operation thereof.

3,612,823
COMBINED DECORATIVE PICTURE AND ELECTRIC ROOM-HEATING DEVICE
Mearl E. Ellison, 10337 Beach St., Bellflower, Calif.
Continuation-in-part of application Ser. No. 640,874, May 24, 1967, now abandoned. This application Jan. 8, 1970, Ser. No. 1,466
Int. Cl. H05b *3/30*
U.S. Cl. 219—345 2 Claims

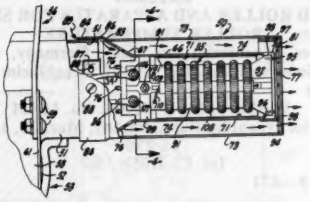


A portable device that presents the appearance of a decorative picture which may be mounted at a desired position on the wall of a room, and when so positioned may be electrically energized to warm objects in the room by radiated heat, as well as to cause the warm air in the room to circulate slowly, with the cooler portion of the circulating air being reheated as it rises in the room adjacent the device. There are hanger elements that keep the device from tilting sidewise. A temperature control is incorporated and there is an indicator light to show when the device is operating.

3,612,824
PORTABLE HEAT GUN

Robert C. Berryman, 785 Lyyski Street, Sparks, Nev., and Robert R. Townsend, 31 Smithridge Park, Reno, Nev.

Filed Dec. 3, 1969, Ser. No. 881,680
Int. Cl. H05b *1/00*; F24h *3/04*
U.S. Cl. 219—370 3 Claims

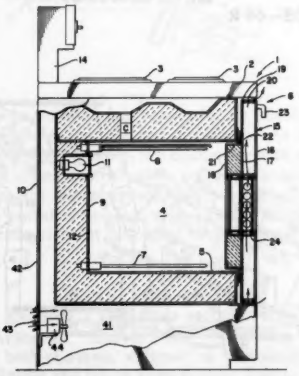


The forward end of a tubular air discharge spout of a portable air blower is encompassed by a tubular collar supported in spaced relation thereto to form an annular channel for flow of ambient cooling air between the collar and spout. A heater tube having a flared aftersection is positioned in registry with the discharge spout to receive air from the channel and spout. The flared end is secured to the forward end of the collar and has a plurality of apertures through which a portion of the air discharges into an annular air passage formed by a tubular shield encompassing the heater tube in concentric spaced relation. The remainder of the air passes through the heater tube and is heated by an electric heater in the tube. The unheated air energizing from the forward end of the annular air passage encompasses the hot air outflow from the heater tube. The volume and temperature of the air discharge is regulated by an adjustable damper on the blower inlet. A switch enables the user to deenergize the heater, thereby affording a controllable airflow at ambient temperature.

3,612,825
WINDOWED HIGH-TEMPERATURE OVENS

William Byer Chase, Northville; Joseph E. Jendrisak, Northville, and Harold E. McKelvey, Plymouth, all of Mich., assignors to Shatterproof Glass Corporation, Detroit, Mich.

Filed Aug. 8, 1969, Ser. No. 848,547
Int. Cl. F27d *11/02*; A21b *1/22*
U.S. Cl. 219—405 23 Claims



Windowed high-temperature ovens including self-cleaning ovens and the like, and windowed doors for those ovens, and window assemblies for installation in such ovens, where the window assembly has at least three spaced parallel glass window panels secured in alignment with two of such panels near the oven cavity enclosing a dead-air or insulating space, and a third of such glass window panels separated from the oven cavity by two dead-air space enclosing glass panels, with the space between the third panel and the two dead-air enclosing panels being ventilated for replacement of heated air therein by cooler air, and a thin semitransparent see-through through metal reflector disposed in the ventilated airspace to reflect substantial proportions of radiant oven heat and to be cooled by air wash during such ventilation.

3,612,826
SURFACE TEMPERATURE INDICATOR LIGHT FOR CERAMIC TOP INFRARED RADIANT RANGE

Homer W. Deaton, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

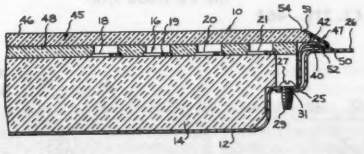
Filed July 17, 1970, Ser. No. 55,816
Int. Cl. H05b *3/68*
U.S. Cl. 219—453 7 Claims

A control panel indicator light arrangement for an infrared cooking range surface unit having a resistance element supported on a heater block underlying an infrared transmissive, translucent cover plate. A double-throw thermostatic switch, having terminals alternatively connected to an auxiliary heater and the indicator light, is supported in heat transfer relation with the heater block by a heat-conducting bracket embedded in the block such that the auxiliary heater is energized with the resistance element to actuate the thermostatic switch at a predetermined temperature allowing the auxiliary heater to initially hold the indicator light circuit closed. After a time interval the thermostatic switch continues to hold the indicator light circuit closed by means of the conductive flow of heat from the heater block to the switch via the bracket such that the arrangement provides visual indication on the control panel of the cover plate temperature condition.

3,612,827
FLAT PLATE SURFACE HEATING UNIT

Raymond L. Dills, Louisville, Ky., assignor to General Electric Company

Filed Jan. 12, 1970, Ser. No. 2,261
Int. Cl. H05b *3/68*
U.S. Cl. 219—463 7 Claims



A flat plate surface heating unit with a recessed pan filled with thermal and electrical insulation. A closely wound, sinuous, electrical resistance heater wire of flattened cross section is arranged in a spiral formation and supported by the insulation. A glass-ceramic disk covers the pan. An insulating spacer is sandwiched between the disk and the heater wire in the interstices between adjacent turns of the spiral, and the spacer slightly overlies the spiral edges of the heater wire. A

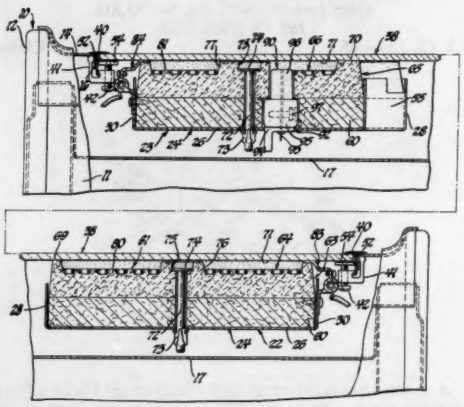
removable trim ring is capable of being fastened to a peripheral flange of the unit pan with a turning action of the ring for locking the ring in place and applying a clamping force on the peripheral edge of the disk.

3,612,828

INFRARED RADIANT OPEN COIL HEATING UNIT WITH REFLECTIVE FIBROUS-CERAMIC HEATER BLOCK

Donald C. Siegla, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 22, 1970, Ser. No. 48,390
Int. Cl. H05b *3/68*
U.S. Cl. 219—464 10 Claims



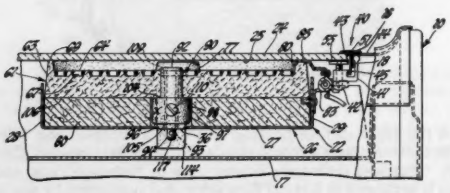
An infrared radiant-type heating unit including a utensil support cover plate of infrared transmissive material, an underlying infrared reflective heater support block having a low thermal mass, and an open coil resistance element directly and continuously supported on the heater block in spaced relation to the cover plate. The heater block is a low density, homogeneous fibrous-ceramic rigid block rendered infrared reflective within a selected wavelength range of approximately 2 to 5 microns by having dispersed throughout the block a defined amount of finely divided pacifiers selected from a group consisting of titanium oxide, zirconium oxide, tin oxide and potassium titanate. The rigid low-density block has tie members extending therein which retain the deeply undulating patterned resistance element within a continuous spiral groove formed in the block permitting controlled accordion-like thermal expansion and contraction of the element.

3,612,829

CERAMIC TOP INFRARED COOKING ASSEMBLY

Jesse L. Evans, Tipp City, and James W. Vannorsdall, Jeffersonville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed July 17, 1970, Ser. No. 55,815
Int. Cl. H05b *3/68*
U.S. Cl. 219—464 7 Claims



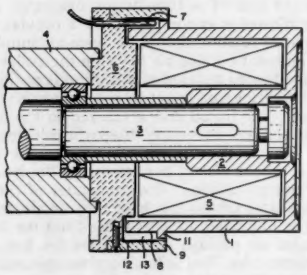
An infrared radiant cooking assembly supported in a range top opening including a frangible glass-ceramic cover plate and an underlying housing for supporting resistance-element heated blocks of inorganic refractor-fiber material in heat-sealed cushioned contact with the undersurface of the cover plate. Resistance element terminal members are provided with the assembly for achieving ready electrical connection with a power source without exceeding the load-bearing capacity of the heater blocks.

3,612,830

HEATED ROLLER AND APPARATUS FOR SENSING ROLLER TEMPERATURE

Fritz Dienes, Muehlheim am Main, Germany, assignor to Dienes-Honeywell Holding GmbH, Muehlheim am Main, Germany

Filed Feb. 16, 1970, Ser. No. 11,651
Claims priority, application Germany, Mar. 20, 1969, G 69 11 276
Int. Cl. H05b *1/02*
U.S. Cl. 219—471 10 Claims



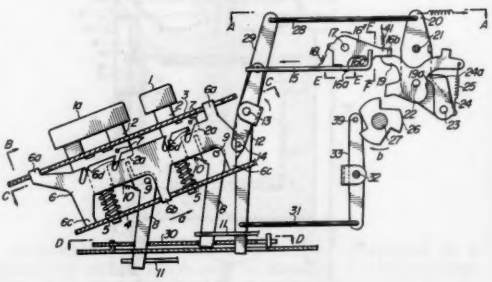
A heated roller includes a cylindrical surface having an annular projecting edge near one end thereof. A stationary annular cover ring encloses a space including the one end of the roller surface and the projecting edge. A stationary temperature sensor is mounted to project into the space.

3,612,831

FUNCTION KEY MECHANISM IN CALCULATING MACHINE OR THE LIKE

Kenji Miyake, Kunitachi-shi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1969, Ser. No. 889,098
Claims priority, application Japan, May 27, 1969, 44/41088
Int. Cl. G06c *23/00*
U.S. Cl. 235—60 R 2 Claims



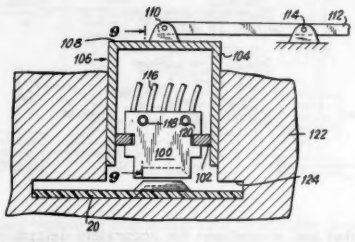
A function key mechanism in a calculating machine or the like, wherein the selection of a lever, a shaft, etc. is effected by the drive of a motor, whereby the force required for operating a function key is remarkably reduced.

3,612,832

EMBOSSMENT READERS FOR IDENTIFICATION CARDS AND THE LIKE

Amnon Goldstein, Forest Hills, and Fred M. Pintus, White Plains, both of N.Y., assignors to Decitron Communication Systems, Inc., Brooklyn, N.Y.

Filed Mar. 11, 1970, Ser. No. 18,434
Int. Cl. G06k 7/10
U.S. Cl. 235—61.11 E 13 Claims



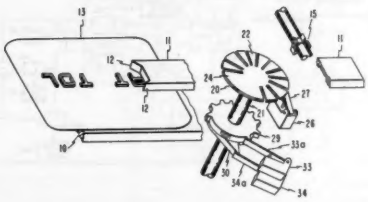
A device capable of "reading" embossments on an identification card or the like. The device includes a scanning unit capable of scanning the embossments, for example, in an optical manner, so as to transmit signals corresponding to the configurations of the embossments. A positioning structure is provided for precisely positioning the embossments with respect to the scanner by directly engaging the embossments which are to be scanned. Thus, it is the embossments themselves which are engaged for determining the location of the embossments with respect to the structure which scans them.

3,612,833

EMBOSSED CARD READING DEVICE

Wilbur M. Davis, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 8, 1969, Ser. No. 789,730
Int. Cl. B41f 3/04; G06k 7/04
U.S. Cl. 235—61.11 C 5 Claims



The disclosure pertains to a reader for an embossed print element which senses the recessed surface portion of the embossed characters by scanning the characters with a series of sensing indicia which each create a yes or no condition. The sensed signals are superimposed upon a series of timing signals which permit a counter and decoder to identify the character or code element which has been scanned.

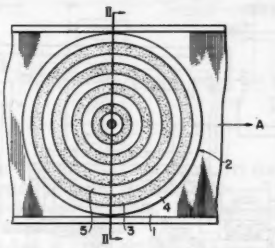
3,612,834

SIGNAL READOUT METHOD AND APPARATUS

Masakazu Arikawa, Ashiya, and Yasuhiko Nohara, Yokohama, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Nihon Doro Kodan, Tokyo, Japan

Filed Sept. 15, 1969, Ser. No. 857,808
Claims priority, application Japan, Oct. 14, 1968, 43/74512
Int. Cl. G06k 7/08
U.S. Cl. 235—61.11 D 8 Claims

A code carrier is in the form of a circular plate comprising concentric metal rings alternating radially with nonmetallic rings. All the rings have substantially the same radial width and preferably substantially the same axial thickness. In accordance with the particular code, certain of the rings are of magnetic metal and certain of the rings are of nonmagnetic metal. The code carrier is passed along a detection path, such as being slid along an aluminum channel. A pair of detectors are positioned along the detection path in alignment with the locus of movement of the center of the code carrier, and are spaced apart longitudinally of the path a distance equal to the radial width of the rings. One of these detectors detects magnetic metal and the other detector detects nonmagnetic metal. The outputs of the two detectors are connected through respective shaping circuits to the two inputs of an AND circuit which provides an output pulse responsive to simultaneous detection of both a magnetic ring and a nonmagnetic metal ring. The nonmagentic metal detector has an output branched therefrom, beyond the respective shaping circuit, and this output provides clock or timing pulses.

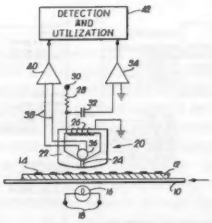


3,612,835

COMBINED OPTICAL AND MAGNETIC TRANSDUCER

Boley A. Andrews, Shawnee Mission, Kans., and James F. Ptacek, Kansas City, Mo., assignors to The Vendo Company, Kansas City, Mo.

Filed Dec. 19, 1969, Ser. No. 886,530
Int. Cl. G06k 7/01
U.S. Cl. 235—61.11 D 11 Claims

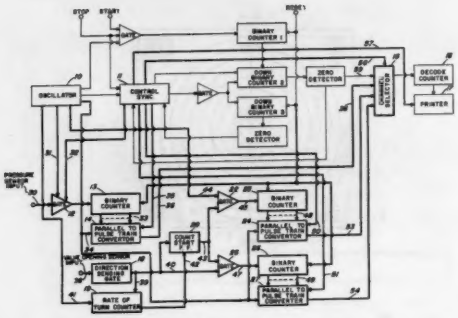


A combined optical and magnetic transducer for sensing both optical and magnetic properties of an article, for example, a piece of paper currency or other document having both visible and magnetic markings to be tested or read, an information-bearing medium such as a data-recording tape to be read, or the like. The transducer comprises a magnetic-sensing head having a transparent gap separating the poles of the magnetic core of the head, a photoelectric element being disposed in the head in alignment with the gap. Outside the head, one side of the article contacts or is in close proximity to the poles at the gap, and the article is illuminated by a light source, so that both magnetic properties and optical properties of the article may be detected simultaneously during relative movement of the article and the transducer.

3,612,836
DIGITAL END SPEED INDICATOR

Robert J. Jordan, Lexington Park; William P. Russell, Leonardtown, and Robert R. Shatzer, Lexington Park, all of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 24, 1970, Ser. No. 13,636
Int. Cl. G06f *7/38*; G06g *7/00*
U.S. Cl. 235—92 FQ 10 Claims

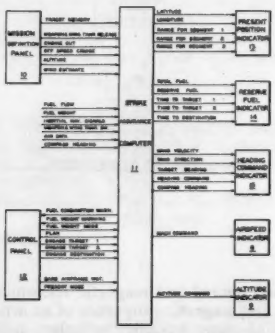


An aircraft catapult launch monitoring system that combines the functions of digitally determining the end speed of the aircraft, determining catapult accumulator pressure and valve opening time and distance. The accumulator pressure is measured by a digital pressure transducer. Valve-opening time is measured by a device that determines the time an angle encoder takes to register the count analogous to the distance opened. Valve-opening length is measured by counting the pulses generated by the angle encoder and translating them to an analogous length.

3,612,837
AIRCRAFT STRIKE ASSURANCE SYSTEM

William E. Brandau, Westwood, N.J., assignor to The Bendix Corporation

Filed Apr. 30, 1969, Ser. No. 820,428
Int. Cl. G06g *7/70*, *7/22*
U.S. Cl. 235—150.2 37 Claims

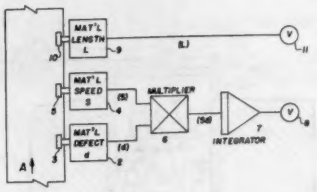


A system for computing all necessary flight commands for successfully completing a mission, including a forecast of fuel reserves and time to each target from planned parameters by combining fuel management data and inertial navigation data. The system provides for primary and alternate targets and is adaptable to inflight mission alterations and unforeseen events such as weather changes and engine failure.

3,612,838
MEANS AND METHOD FOR THE CONTINUOUS NONDESTRUCTIVE TESTING OF METALLIC STRIP AND THE LIKE

Don L. Conn, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed July 16, 1969, Ser. No. 842,264
Int. Cl. G01b *19/32*; G01n *19/08*
U.S. Cl. 235—151.3 25 Claims

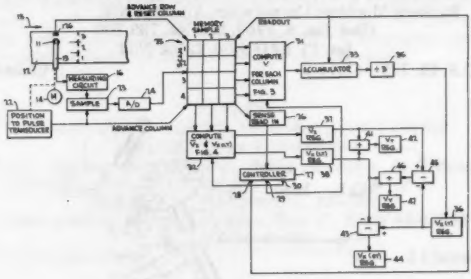


Apparatus and procedures for accurately determining the quality of metallic strip or other essentially homogenous materials by multiplying direct current voltages which are the functions of (a) the magnitude of defect indications and (b) strip speed, accumulating the multiplied voltages, and dividing the accumulated voltages by a proportional figure representing the total length of material tested.

3,612,839
VARIANCE PARTITIONING

John E. DeWitt, Lake Oswego, Oreg., and David A. Spitz, Columbus, Ohio, assignors to Industrial Nucleonics Corporation

Filed Nov. 13, 1967, Ser. No. 682,402
Int. Cl. G01n *25/56*; G06f *7/38*
U.S. Cl. 235—151.35 70 Claims



Disclosed are a system for and method of dividing or partitioning the total variance properties of a moving sheet into the components of: cross direction; long-term machine direction; short-term machine direction; total machine direction; cross direction; and profile. A single detector for the property is scanned at right angles to the sheet edges a plurality of times. During each scan the property is sampled a plurality of times to derive a profile contour. A computer responds to the sampled values to derive the variance components.

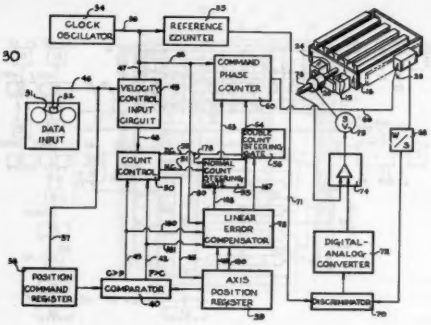
3,612,840
LINEAR ERROR COMPENSATOR FOR NUMERICALLY CONTROLLED MACHINE TOOLS

Richard E. Stobbe, Greenfield, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Sept. 8, 1969, Ser. No. 856,042
Int. Cl. H02p *1/54*; G06f *15/46*
U.S. Cl. 235—151.11 4 Claims

Within a pulse-counting numerical control system for a machine tool, a signal modifier is connected to effect the ad-

dition or subtraction of a predetermined number of pulses to

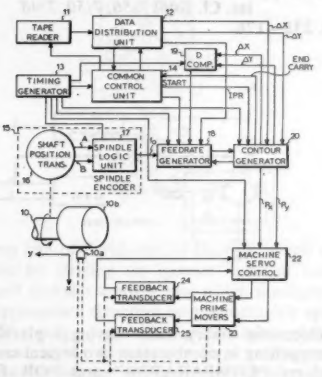


the control system to compensate for repeatable linear errors that may appear in the machine's slidable members.

3,612,841
METHOD AND APPARATUS FOR FEEDRATE CONTROL OF SPINDLE-RELATED NUMERICAL CONTROL SYSTEMS

Marion Kosem, Willoughby Hills, and Clive P. Hohberger, Shaker Heights, both of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed July 10, 1969, Ser. No. 840,778
Int. Cl. G05b *19/18*
U.S. Cl. 235—151.11 **10 Claims**



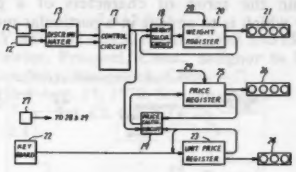
In a numerical control system, a method and apparatus for controlling the feedrate of a machine tool as a function of spindle speed (angular velocity). A spindle encoder provides basic feedpulses at a frequency f_o as a function of spindle speed. A feedrate generator multiplies the frequency f_o by a factor derived from a programmed model velocity in inches per revolution (IPR) and the vectorial departure (D), or its reciprocal, derived from programmed departures along two axes. Thus vectorial velocity is maintained as a function of spindle speed.

3,612,842
PRICE COUNTING BALANCE

Takashi Aga, and Masami Yamanaka, both of Hyogo-ken, Japan, assignors to Yamato Scale Company, Limited, Hyogo-ken, Japan

Filed Mar. 26, 1969, Ser. No. 810,629
Claims priority, application Japan, Sept. 5, 1968, 43-63909
Int. Cl. G01g *9/00*; G06f *15/20*
U.S. Cl. 235—151.33 **3 Claims**

A price counting balance utilizing electronic means for producing an indication of total weight or price of a commodity. The electronic means utilizing a patterned strip for producing a pulse train with the pulse train being arranged to

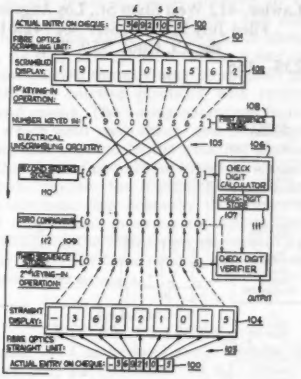


provide a pulse corresponding to the price for each unit weight.

3,612,843
CHECKING THE FEED-IN OF DATA TO DATA-PROCESSING APPARATUS

Bernard Aptroot-Soloway, London, England, assignor to Soval Limited, London, England

Filed Aug. 4, 1969, Ser. No. 847,320
Claims priority, application Great Britain, Aug. 6, 1968, Oct. 2, 1968, 37,356/68;46,858/68
Int. Cl. G06k *5/02*; G06f *11/04*
U.S. Cl. 235—153 **20 Claims**



For transferring a sequence of data characters from a source document into a data-processing system, an operator is caused in one operation to read and feed-in the characters in a first predetermined order, for example as they appear on the document. In another operation the operator is caused to read and feed-in the same characters rearranged in a second predetermined order. Logical circuitry rearranges the characters fed-in in one of these operations, so as to formulate electronically a sequence which should be identical with the sequence fed-in in the other of these operations, and compares these last two sequences with one another. If these last two sequences are identical, the data characters can be read out electronically from the circuitry in their original order.

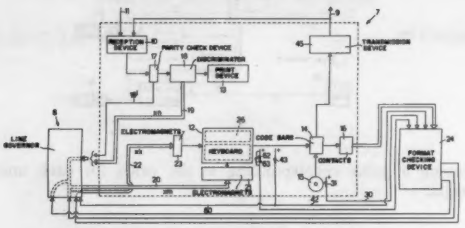
3,612,844
DATA TRANSMISSION SYSTEM

Giovanni Zaffignani, and Bruno Brunialti, both of Ivrea, Italy, assignors to Ing C. Olivetti & C., S.p.A., Ivrea, Italy

Filed July 2, 1969, Ser. No. 838,608
Claims priority, application Italy, July 2, 1968, 52266-A/68
Int. Cl. G06t *11/00*
U.S. Cl. 235—153 **6 Claims**

A terminal apparatus is described for a data transmission system which transmits messages constituted by a series of characters. The terminal apparatus includes means for checking the entering of messages for determining when er-

rors occur in the manual entry of information. The terminal apparatus includes a manually operated means for entering characters, and a presettable means for indicating the position within the series of characters of a predetermined character which is to appear in a particular message format.



A given message format may be selected from a number of message formats. A checking means is provided to determine if the predetermined character is entered in the proper position within a series of characters, and if not, an error signal is generated which indicates the absence of the predetermined character from the position in question.

3,612,845

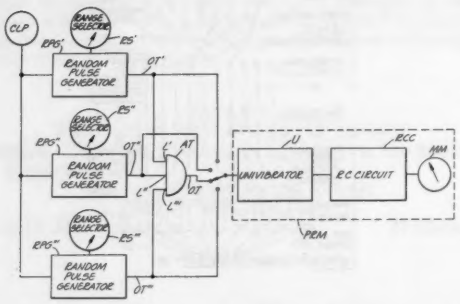
COMPUTER UTILIZING RANDOM PULSE TRAINS

Reed C. Lawlor, 412 West Sixth St., Los Angeles, Calif.

Filed July 5, 1968, Ser. No. 742,619

Int. Cl. G06f *7/50, 7/52*

U.S. Cl. 235—156 **17 Claims**



Noise signals from a diode and clock pulses from a clock pulse source are fed to input legs of a logic circuit such as an AND gate, causing pulses of variable amplitude to appear in the output of the circuit. A threshold circuit suppresses pulses having amplitudes below a predetermined level. The remaining pulses trigger a univibrator thus causing pulses to be generated at random times in synchronism with clock pulses thereby forming a train of synchronous random pulses. Trains of random pulses from several such random pulse generators are fed to logic circuits to perform arithmetic operations, such as multiplication.

3,612,846

CALCULATING MACHINES WITH CONTROL CIRCUITS TO ENTER FIRST NUMBER

James John Drage, and Norbert Kitz, both of Middlesex, England, assignors to Bell Punch Company Limited, London, England

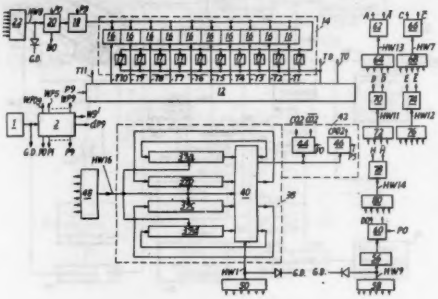
Filed July 25, 1969, Ser. No. 844,931

Claims priority, application Great Britain, Feb. 17, 1969, 8579/69

Int. Cl. G06f *7/385*

U.S. Cl. 235—168 **9 Claims**

An electronic calculating machine having a plurality of registers for containing numbers is disclosed, having an input register and an enter key for entering a first number into the input register and initiating an operation of corresponding control circuits, including the clearing of a register defined



by a previous program adding this number in an accumulator register and entering the sum to both the input register and accumulator register.

3,612,847

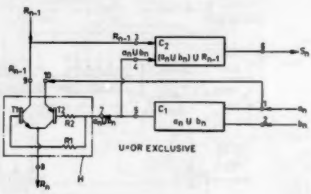
ELECTRICAL APPARATUS AND METHOD FOR ADDING BINARY NUMBERS

Pierre Jorgensen, L'Hay-Les-Roses, Seine, France, assignor to Compagnie De Saint-Gobain, Neuilly-sur-Seine, France

Continuation-in-part of application Ser. No. 444,642, Apr. 1, 1965, now Patent No. 3,348,199, which is a division of application Ser. No. 660,112, Aug. 11, 1967, now abandoned. This application Oct. 30, 1968, Ser. No. 771,737

Int. Cl. G06f *7/56, 7/50, 7/48*

U.S. Cl. 235—176 **48 Claims**



An electronic binary adder having a plurality of stages, each comprising in combination two logical circuits adapted to perform "COMPARATOR" and "OR EXCLUSIVE" functions and a logical commutator or "IF" switch circuit interconnected to compute the sum of digits of corresponding rank in two binary numbers and the carryover from the summation of the digits of next lower rank in said numbers, and to simultaneously compute also the carryover, if any, to be added to the sum of the digits of next higher rank. Any or each of said logical circuits may comprise a radiation-emitting means controlled by signal input and radiation-controlled signal output means.

3,612,848

REFRIGERATOR LIGHT STRUCTURE

Alan J. Koch, and Robert Edward Lindenschmidt, both of Evansville, Ind., assignors to Whirlpool Corporation

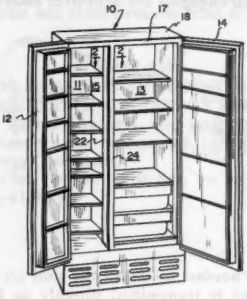
Filed Apr. 15, 1970, Ser. No. 28,878

Int. Cl. A47b *97/00*

U.S. Cl. 240—4 **9 Claims**

A refrigerating apparatus such as a combined refrigerator and freezer having a pair of compartments that are side-by-side and separated by a wall having an edge in which an electric light is located at this edge and exposed to both compart-

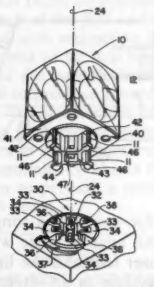
ments for lighting them simultaneously. This light is preferably an elongated fluorescent bulb extending substantially the full length of this edge which is positioned adjacent a normally closed access door.



3,612,849
MULTILAMP FLASH UNIT

David E. Beach, Rochester, N.Y., assignor to Sylvania Electric Products, Inc., Danvers, Mass.

Filed Oct. 8, 1968, Ser. No. 765,930
Int. Cl. G03b *15/02*
U.S. Cl. 240—1.3 **1 Claim**

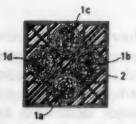


A multilamp unit of flashlamps of the type which are percussion-firable by striking an ignition tube of individual lamps. The unit includes a novel base which is adapted to be received in appropriate structure on photographic apparatus and which will rigidly support the ignition tubes of the flash unit for percussion yet maintains a large striking zone in which firing mechanism can contact the firing tube.

3,612,850
PHOTOFLASHLAMP HOLDER

Louis Marius Nijland, and Wilem Westerveld, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 7, 1969, Ser. No. 822,679
Claims priority, application Netherlands, May 11, 1968, 6806733
Int. Cl. G03b *15/02*
U.S. Cl. 240—1.3 **9 Claims**

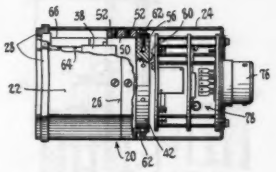


A flashcube having a plurality of flashlamps, a reflector secured adjacent each lamp, and a transparent mass such as plastic surrounding and embedding each lamp for providing protection against possible explosion of the lamps.

3,612,851
ROTATABLY ADJUSTABLE INDICATOR INSTRUMENT

Howard R. Fowler, Prospect, Conn., assignor to Lewis Engineering Company, Naugatuck, Conn.

Filed Apr. 17, 1970, Ser. No. 29,457
Int. Cl. G01d *11/28*
U.S. Cl. 240—2.1 **9 Claims**

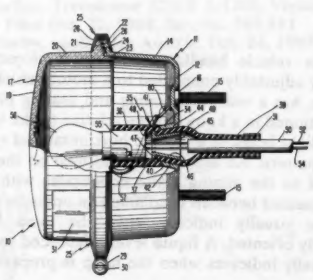


An indicating instrument having a tubular casing with a viewing window at one end. Within the casing there is an instrument movement including a dial which is carried at the front of the movement, facing outward at the casing window. A thick mounting or base ring at the rear of the instrument movement carries the latter and has a rotary bearing in an adapter ring which latter is rigidly secured to the casing between the front and rear ends thereof. The adapter ring has slots through which there extend screws threaded into the base ring. By such arrangement the base ring and instrument movement carried thereby may be secured in any of a number of different rotative positions with respect to the adapter ring and casing. The casing comprises front and rear tubular parts which abut each other, and the adapter ring is disposed within and secured to the abutting portions of the casing parts, thereby to fasten these together. Removal of the rear casing part reveals the fastening screws which are threaded into the base ring, whereby these may be readily loosened and retightened in order to change the rotative position or attitude of the instrument movement and dial in the front casing part while these remain supported therein.

3,612,852
LEAK-PROOF LIGHT

Armen Bogossian, 584 Cumberland Ave., Teaneck, N.J.

Filed May 23, 1969, Ser. No. 827,391
Int. Cl. B60q *1/26, 1/44*
U.S. Cl. 240—8.3 **11 Claims**

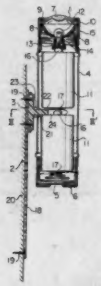


A leak-proof light adapted to use, for example, on a vehicle. A gasket between the mating flanged surfaces of the lens and the casing and an elastomeric tube for the electrical conduit in an aperture in the rear of the casing keep the light sealed against the intrusion of water despite its submersion in water to a considerable depth. The elastomeric tube is expanded by an internal sleeve member seating the tube against the aperture of the casing. The light incorporates a vibration-cushioning mount for the electric lamp mounting means that is part of the elastomeric tube which seals the electric cable to the housing of the light.

3,612,853
FLASHLIGHT DEVICE

Sakaki Aoki, Tokyo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 30, 1968, Ser. No. 787,864
Claims priority, application Japan, Nov. 12, 1968, 43/100179
Int. Cl. F21l 7/00
U.S. Cl. 240—10.6 R 12 Claims

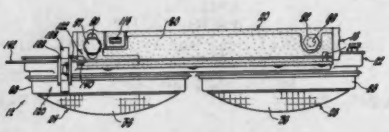


A flashlight device particularly advantageous in using for emergency purposes. The device comprises a combination of a flashlight body including a normally closed electric circuit for lighting a bulb therein, and a flashlight hanger member to be installed at a fixed position and including a means for blocking said electric closed circuit only when the flashlight body is hung or mounted to the hanger member.

3,612,854
HEADLAMP WITH INTEGRAL AIMING AND INSPECTION GAGES

Harold E. Todd, and George W. Onksen, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 29, 1968, Ser. No. 779,880
Int. Cl. F21v 7/00, 19/02, 21/16
U.S. Cl. 240—41.6 5 Claims



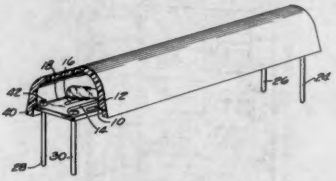
A motor vehicle headlamp wherein a projection lamp, universally adjustably connected to a motor vehicle by a unitary hinge, has a rearward aiming and seating plane which, when positioned in a known plane relative to the vehicle, will project a light beam in a desired horizontal and vertical illumination pattern. An aiming block formed on the hinge and referenced to the aiming plane cooperates with an aiming string connected between headlamps on opposite sides of the vehicle to visually indicate when the lamp is properly horizontally oriented. A liquid level referenced to the aiming plane visually indicates when the lamp is properly vertically oriented.

3,612,855
ILLUMINATED BUS

Paul B. Juhnke, Route 2, Box 228, East Troy, Wis.

Filed Oct. 17, 1969, Ser. No. 867,284
Int. Cl. G09f 9/14; F21v 21/08
U.S. Cl. 240—52.1 6 Claims

An insulating base has a plurality of conductors on one side. A plurality of mounting prongs extend through the base and project from the other side. These prongs have bent-over ends connected to the conductors. A number of small lamps are connected to the conductors. A translucent cover is seated on the base and houses the lamps. This cover has portions overlying and engaging the bent-over ends of the prongs

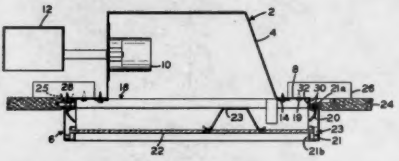


so that pressure needed to install the unit on a panel of a dispatching board is transmitted directly to the mounting prongs. The bent-over ends also prevent the prongs from becoming detached when the unit is removed from the panel.

3,612,856
LIGHTING FIXTURE FOR A TILE CEILING

James E. Hazeley, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Continuation of application Ser. No. 692,850, Dec. 22, 1967, now abandoned. This application Apr. 22, 1970, Ser. No. 28,285
Int. Cl. F21s 1/06
U.S. Cl. 240—78 CF 1 Claim

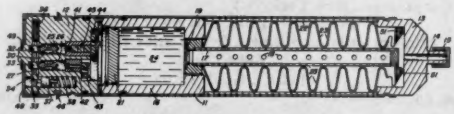


A ceiling fixture for use with a tongue and groove joint ceiling tile system. An adapter plate which functions as the support for the diffuser lens and the light box is fastened to the ceiling support system as an integral part of the ceiling tile arrangement. The adapter plate has the necessary edge configuration to permit it to be placed within the ceiling tile arrangement as a substitute for one individual ceiling tile.

3,612,857
LOCATION MARKER FOR PRODUCING LUMINOUS DISPLAY

Dave P. Beatty, Worthington, and James O. Reinhart, Bloomfield, both of Ind.

Filed Mar. 16, 1970, Ser. No. 19,896
Int. Cl. F21v 9/16
U.S. Cl. 240—2.25 5 Claims



A location marker having a first compartment containing at least one cloth streamer saturated with a chemiluminescent material and having a second compartment containing an activator composition for activating the chemiluminescent material, said first and second compartments being separated by a frangible barrier. A fuze section is provided having first and second triggering means whereby said first triggering means activates a gas-generating component

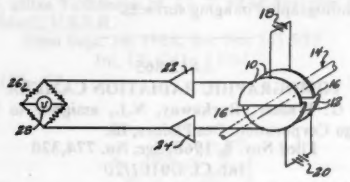
to cause said activator composition to rupture said frangible barrier and saturate said at least one cloth streamer, and whereby said second triggering means actuates a pyrotechnic delay train which, in turn, ignites an explosive composition to eject said at least one cloth streamer from its compartment.

3,612,858

DEVICE FOR MEASURING THE POSITION, SIZE AND INTENSITY OF HIGH-ENERGY PARTICLES

Theodore De Parry, Elmhurst, Ill., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 10, 1970, Ser. No. 10,174
U.S. Cl. 250—41.95 R 6 Claims



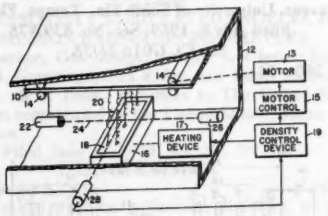
A particle beam position monitor includes first and second pairs of plates mounted normal with respect to the longitudinal axis of the particle beam on opposite sides thereof. The associated plates of each of the first and second pairs are fixedly spatially mounted with respect to each other and each have one edge positioned to lie in a single plane parallel to the longitudinal axis of the particle beam. A pair of voltage sources are connected to produce potentials between the associated plates of the first and second pairs respectively and a pair of electrometers measure secondary electron emission from the pairs of plates in the presence of the particle beam. A bridge circuit differentially combines the measured secondary electron emission to provide a relative measure of the position of the particle beam.

3,612,859

METHOD FOR MEASURING AND CONTROLLING THE DENSITY OF A METALLIC VAPOR

Wilhelm W. B. Schumacher, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1968, Ser. No. 701,965
Int. Cl. G01n *9/24*
U.S. Cl. 250—43.5 D 2 Claims



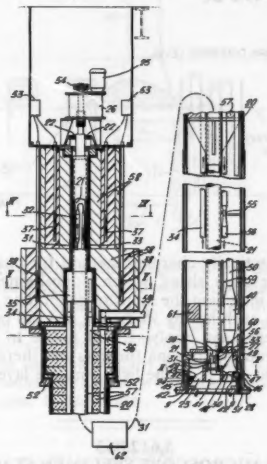
Method for measuring the density of vapors by the use of electromagnetic radiation such as X-rays or by corpuscular beams such as electrons. A beam of electromagnetic radiation is directed through a metallic vapor to be measured. The density is determined by measuring either scattered electrons, the emission of visible light, or the emission or absorption of X-rays.

3,612,860

EQUIPMENT FOR MONITORING THE RADIOACTIVITY OF COOLANT IN A NUCLEAR REACTOR

Stanley Hackney, Appleton Park, near Warrington, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 5, 1968, Ser. No. 750,052
Claims priority, application Great Britain, Aug. 14, 1967, 37329/67
Int. Cl. G01t *3/00*; G21c *17/02*
U.S. Cl. 250—43.5 8 Claims



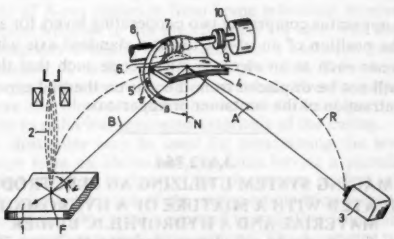
Equipment for testing for failed nuclear reactor fuel elements has means for presenting samples of coolant from individual fuel elements or groups thereof sequentially to a first detector for detecting such radiation as would be associated with a coolant sample from a failed element, means for presenting the bulked remaining samples to a second separate detector for the said radiation and means to cause the sequentially selected sample to join the bulked samples after passing the first detector. The described equipment is particularly suitable for employment with a liquid metal cooled fast nuclear reactor.

3,612,861

METHOD OF AND APPARATUS FOR THE AUTOMATIC REFOCUSING OF X-RAY SPECTROMETERS

Gerhard Dorfler, Treustrasse 52/1/8 A-1200, Vienna, Austria

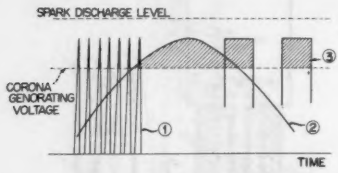
Filed Oct. 22, 1968, Ser. No. 769,511
Claims priority, application Austria, Oct. 24, 1967, A9583
Int. Cl. G01n *23/22*
U.S. Cl. 250—49.5 13 Claims



In fully focusing X-ray spectrometers, in order to correct the measuring error caused by a change of the Bragg-angle due to the excursions of the electron beam that scans the sample, the diffracting crystal is rotated synchronously to cancel said change. The rotation of the crystal is effected by

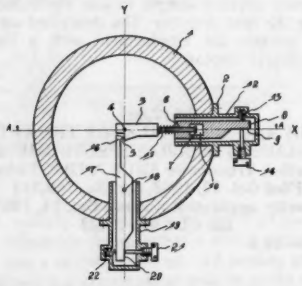
an electromotor energized by a voltage derived from a comparison of a DC sawtooth voltage (the electron beam-deflecting voltage) with a DC voltage varied by said electromotor.

3,612,862
ELECTROSTATICALLY CHARGING METHOD
Masanari Suzuki, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed May 5, 1969, Ser. No. 821,699
Claims priority, application Japan, May 8, 1968, 43/30703
Int. Cl. G03g *13/02, 15/02*
U.S. Cl. 250—49.5 ZC **5 Claims**



An electrostatically charging method for charging a light sensitive layer copy sheet, which is positioned close to a charging grid including the steps of generating spike-shaped voltage pulses each having sharp rise and fall portions and a pinpointed peak, and applying said pulses to the charging grid for generating a corona thereat, and thereby imparting an electrostatic charge to the light sensitive layer of the copy sheet.

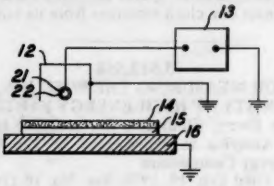
3,612,863
ELECTRON MICROSCOPE SPECIMEN STAGE WHICH MAINTAINS SPECIMEN POSITION WHEN SUBJECTED TO THERMAL FLUCTUATIONS
Shigeru Suzuki, Tokyo, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 25, 1969, Ser. No. 879,887
Claims priority, application Japan, Nov. 29, 1968, 43-87478
Int. Cl. H01j *37/20*
U.S. Cl. 250—49.5 B **3 Claims**



An apparatus comprising two cooperating levers for adjusting the position of an object about a standard axis within a container such as an electron microscope such that the object will not be displaced from the axis on thermal expansion or contraction of the container or apparatus.

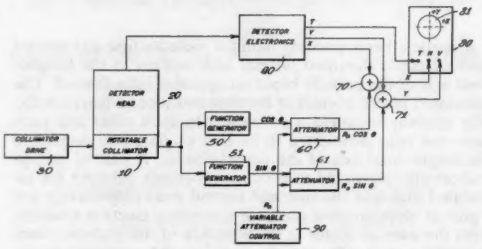
3,612,864
IMAGING SYSTEM UTILIZING AN ELECTRODE TREATED WITH A MIXTURE OF A HYGROSCOPIC MATERIAL AND A HYDROPHILIC BINDER
Yasuo Tamai, Asaka-shi, Japan, assignor to Yasuo Tamai, Asaka-shi, Japan and Xerox Corporation, Rochester, N.Y.
Filed Dec. 18, 1968, Ser. No. 784,840
Claims priority, application Japan, Jan. 13, 1968, Jan. 17, 1968, 43-1832;43-2463
Int. Cl. H01j *1/14*
U.S. Cl. 250—49.5 GC **15 Claims**

A corona discharge system comprising a filament treated with a hygroscopic material or a mixture of a hygroscopic



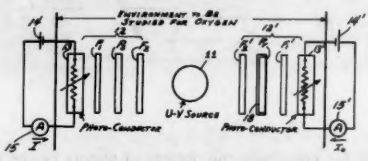
material and a hydrophilic binder is employed for charging electrophotographic imaging surfaces.

3,612,865
TOMOGRAPHIC RADIATION CAMERA
William G. Walker, Rockaway, N.J., assignor to Nuclear-Chicago Corporation, Des Plaines, Ill.
Filed Nov. 8, 1968, Ser. No. 774,320
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 **14 Claims**



An Anger-type stationary radiation detector having an angular, multichannel collimator rotatably mounted thereon. Output circuitry associated with the rotation of the collimator translates the detector output coordinate signals into selected tomographic images of the distribution of radionuclides throughout a stationary object under investigation.

3,612,866
INSTRUMENT FOR DETERMINING OXYGEN QUANTITIES BY MEASURING OXYGEN QUENCHING OF FLUORESCENT RADIATION
Brian Stevens, University of South Fla., Tampa, Fla.
Filed July 8, 1969, Ser. No. 839,875
Int. Cl. G01n *21/38*
U.S. Cl. 250—71 **10 Claims**



Apparatus for measuring oxygen concentration based on oxygen quenching of molecular luminescence; the quenching

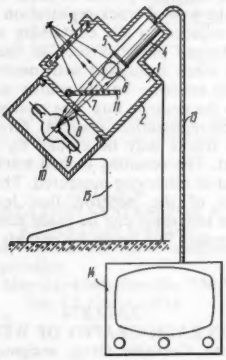
is evaluated by comparison with an oxygen-shielded reference member in the same environment, using respective photosensitive detectors responding to fluorescence from an unshielded fluorescing member and the reference member.

3,612,867

X-RAY TELEVISION MICROSCOPE

Nikolai Vasilievich Rabodzei, oblasti, Institutskaya ulitsa, 6-a, kv. 39; Vladimir Alexandrovich Astrin, oblasti, Institutskaya ulitsa, 12, kv. 19; Nina Vasilievna Kuzmicheva, oblasti, Institutskaya ulitsa, 21, kv. 31; Gennady Vladimirovich Shidlovsky, oblasti, Tsentialnaya ulitsa, 2-a, kv. 56; Evgeny Mikhailovich Ljubimov, oblasti, ulitsa Tsentranaya 19, kv. 12, and Mikhail Nikolaevich Nadobnikov, oblasti, ulitsa Voxalnaya 21, kv. 7, all of Fryazino Moskovskoi Oblasti, U.S.S.R.

Filed Sept. 24, 1968, Ser. No. 761,958
Int. Cl. G01n *23/04*
U.S. Cl. 250—77 **3 Claims**



An X-ray television microscope has a mirror disposed in a radiation protection chamber in the path of an X-ray beam between the object being irradiated and an X-ray source and at an angle of 45° relative to the X-ray beam axis. The mirror permits observation and recording through a window in the working chamber of the actual position of the object being irradiated in two projections, while the X-ray beam axis is inclined to the horizontal at an angle of 30° to 60° to reduce the dimensions of the instrument and to facilitate its operation.

3,612,868

HIGH-SENSITIVITY STIMULATED EXOELECTRON EMISSION RADIATION DOSIMETERS

Klaus H. Becker, Oak Ridge; Joseph S. Cheka, Knoxville; Richard B. Gammage, Oak Ridge, and Eddie M. Robinson, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed June 26, 1970, Ser. No. 50,270
Int. Cl. G01t *1/04*
U.S. Cl. 250—83 R **19 Claims**

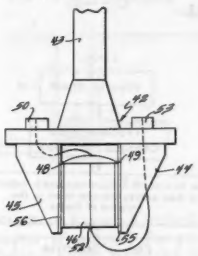
An inert metal, such as palladium, platinum, or gold, in low concentration, impregnated or diffused to a sufficient depth in materials which exhibit the physical effect of stimulated exoelectron emission (SEE), substantially increases the radiation sensitivity of the SEE materials by permitting a larger percentage of exoelectrons to be emitted therefrom. The reproducibility of response is also increased. Impregnation or diffusion in such materials can be accomplished, for example, by thermal diffusion of metal layers into the surface or throughout the bulk material. The exact procedure for obtaining optimized sensitivity depends upon which inert metal is utilized with a given SEE material, the thickness of the metal, and the diffusion conditions.

3,612,869

LARGE VOLUME PLANAR PAIR GERMANIUM (LITHIUM) DETECTOR

John J. Baum, Anaheim, Calif., and Harold W. Helenberg, Calumet City, Ill. assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 27,1970, Ser. No. 14,987
Int. Cl. G01t *1/24*; H01l *15/00*
U.S. Cl. 250—83 R **2 Claims**



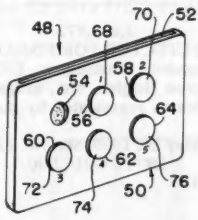
An assembly of lithium-drifted germanium detectors of the planar type combines the good detection characteristics of the planar detector with the large volume of the coaxial drift geometry. The detector assembly is constructed by placing two lithium-drifted germanium detector diodes back to back and connecting them electrically in parallel. The detector is held in a mounting structure which maintains each of the diodes at the same temperature.

3,612,870

DOSIMETER AND METHOD FOR DETERMINING THE LEVEL OF RADIATION FROM AN ELECTRONIC APPARATUS HAVING A PLURALITY OF RADIATION-EMITTING SURFACES

John F. Brennan, Grosse Point, Mich., assignor to Vincent J. Brennan and Michael J. Brennan, part interest to each

Filed Sept. 3, 1968, Ser. No. 756,856
Int. Cl. G01t *1/08*
U.S. Cl. 250—83 **7 Claims**



The dosimeter is particularly useful in checking the amount of X-ray radiation from home television receivers to determine whether or not the receivers are safe. The dosimeter comprises a casing which contains a radiation sensitive film packet. A radiation screen is provided in front of the film packet. Means are provided to either move the screen or to move the film to selectively expose different portions of the film to radiation generated exteriorly of the casing.

The dosimeter may be used for determining the level of radiation from an electronic apparatus having a plurality of radiation-emitting surfaces. The dosimeter is first placed closely adjacent to one of the radiation-emitting surfaces. A portion of the film is then exposed to radiation from the surface for a predetermined time interval. The dosimeter is then selectively placed adjacent to each of the remaining radiation-emitting surfaces and other portions of the film are exposed to radiation for predetermined time intervals. The film is then developed and the amount of dosage received by each of the exposed portions is measured. The results of this measurement are compared with a standard to determine whether or not the radiation from the apparatus is within safe limits.

3,612,871

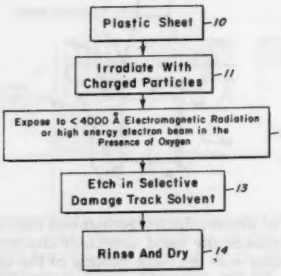
METHOD FOR MAKING VISIBLE RADIATION DAMAGE TRACKS IN TRACK REGISTRATION MATERIALS

Wayne T. Crawford, Livermore, Calif.; James S. Humphrey, Jr., Schenectady, N.Y., and Warren De Sorbo, deceased, late of Ballston Lake, N.Y. (by Muriel J. De Sorbo, administratrix), assignors to General Electric Company

Continuation-in-part of application Ser. No. 741,190, June 28, 1968, now abandoned. This application Apr. 1, 1969, Ser. No. 812,463

Int. Cl. G01t 5/00, 5/02

U.S. Cl. 250—83 17 Claims



An improved method for treating a plastic film by charged particle irradiation to make tracks formed in the film visible. The film is subjected to irradiation with charged particles, then is exposed to radiation selected from the group consisting of electromagnetic radiation having wavelengths less than about 4,000 angstroms and electrons having energy levels above about 1.5×10^6 electron volts in the presence of oxygen. When treated with a solvent which preferentially attacks the material along the particle tracks, the tracks dissolve away rapidly, leaving substantially cylindrical holes in the film, with little degradation of the body of the film. This preetching treatment results in more rapid etching of the damage tracks, in tracks of more uniform cross section, in smaller initial pore sizes and in greater thermal stability of the tracks.

3,612,872

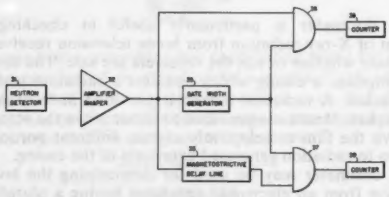
SELECTIVE DETECTOR FOR FISSION NEUTRONS

Robert J. Omohundro, Washington, D.C., and Frank A. Marchetti, Hillcrest Heights, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed May 26, 1969, Ser. No. 827,699

Int. Cl. G01t 3/00

U.S. Cl. 250—83.1 5 Claims



The invention distinguishes fissionable neutron sources from nonfissionable sources by utilizing the principle that only a fissionable source emits simultaneously a plurality of neutrons during a single fission event. The simultaneously emitted neutrons are counted in a first coincidence circuit together with random pulses from neutrons emitted by α,n reactions. A second coincidence circuit counts only those neutrons which were emitted separately at spaced intervals of time by α,n reactions and does so by including a delay device in one leg of the coincidence circuit to throw out of coincidence the pulses from the simultaneously emitted neutrons.

3,612,873

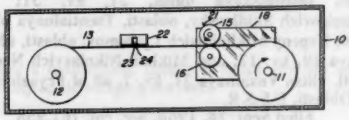
NEUTRON FLUX RECORDER UTILIZING A CONTINUOUS WEB OF TRACK-REGISTRATION MATERIAL

Henry Ward Alter, Danville, Calif., assignor to General Electric Company

Filed Dec. 23, 1968, Ser. No. 786,168

Int. Cl. G01t 3/00, 5/00

U.S. Cl. 250—83.1 16 Claims



A neutron flux recorder is disclosed which is capable of continuously monitoring the neutron flux level of a nuclear reactor over an extended period of time. This recorder utilizes a continuous web of track-registration material which is slowly passed adjacent a slit containing a source material which emits charged particles such as fission fragments or alpha particles when irradiated with neutrons. The rate of charged particle emission by the source material is directly proportional to the neutron flux. The charged particles which strike the track-registration material form damage tracks therein. These tracks may be etched by treatment with a suitable etchant. The resulting etched tracks are visible and may be counted or otherwise measured. This produces a permanent record of the neutron flux level adjacent the recorder. These recorders can be made tamperproof and are capable of recording flux levels for periods on the order of a year.

3,612,874

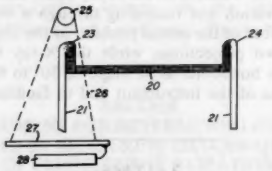
NEUTRON RADIOGRAPHY OF WELD JOINTS

Charles R. Porter, Corvallis, Oreg., assignor to General Electric Company

Filed July 16, 1968, Ser. No. 745,210

Int. Cl. G01t 3/00

U.S. Cl. 250—83.1 4 Claims



A nondestructive neutron radiographic technique capable of producing improved radiographs of weld joints is disclosed. Lack of contrast in neutron radiographs of two pieces which have been welded together makes resolving fine gaps in the weld difficult. In the disclosed system, one of the two pieces to be welded is doped with a small amount of a material having a high neutron absorption cross section. This provides the desired radiographic contrast and permits the inspection of an entire weld in one radiograph.

3,612,875

MOSSBAUER SPECTROMETER

Richard Neil Ord, Richland, Wash. assignor to the United States of America, as represented by the United States Atomic Energy Commission

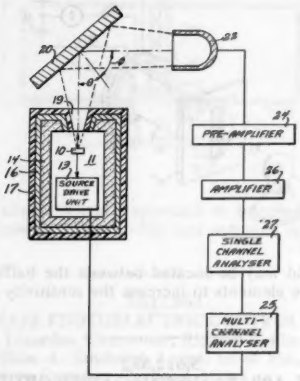
Filed Oct. 15, 1970, Ser. No. 82,380

Int. Cl. G01t 1/16

U.S. Cl. 250—83.3 R 5 Claims

A Mossbauer spectrometer includes a source shielded by a layer of depleted uranium covered with a layer of graded shielding material. A detector is placed so that it is shielded

from the gamma radiation from the source. The sample being examined is inclined at an angle to the beam of gamma rays



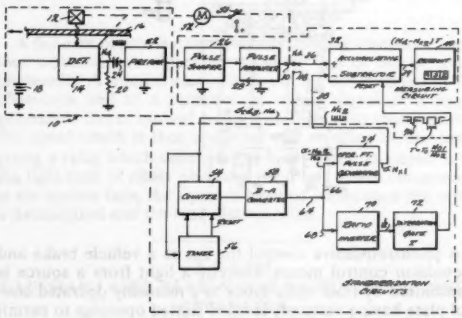
from the source so that the resonant and nonresonant gamma-ray energy is directed to the detector.

3,612,876

STANDARDIZATION SYSTEM FOR A DIGITAL RADIATION GAUGE

Michael P. Grant, Columbus, Ohio, assignor to Industrial Nucleonics Corporation

Filed May 21, 1968, Ser. No. 730,708
Int. Cl. G01n *23/16*
U.S. Cl. 250—83.3 **17 Claims**



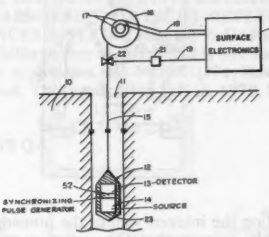
A system for measuring weight per unit area using a nucleonic gauge with simplified standardization circuits. In one embodiment the standardization circuitry is all digital, and in another embodiment, is partially digital. In those two embodiments and a third embodiment the standardization circuitry is operated in accordance with the count of detector output pulses occurring during a predetermined interval during a standardization time. In the latter embodiment, this digital count signal is converted to an analog signal to vary the operating point pulse rate directly and the counting time inversely. In the other two embodiments, the digital count signal is employed to set a down counter to the corresponding count, and then the counter counts down for an interval of time. In one embodiment the analog of the digital count signal is employed to determine the count down time, while another embodiment utilizes the digital count signal itself to establish that count down interval.

3,612,877

VISUAL DISPLAY OF THE DECLINE OF THE THERMAL NEUTRON POPULATION IN A WELL BOREHOLE

Eric C. Hopkinson, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 23, 1968, Ser. No. 699,853
Int. Cl. G01v *5/00*
U.S. Cl. 250—83.3 **7 Claims**



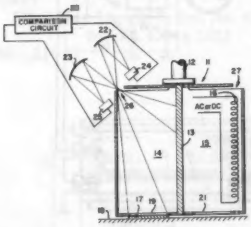
A well logging instrument having a pulsed neutron source and a radiation detector is adapted for travel through an earth borehole. The signal pulses from the detector are sent to the surface electronics, along with the neutron source synchronization pulses. In the surface electronics, the signal pulses are separated from the synchronization pulses. The synchronization pulses then drive a sawtooth generator, the duration of the ramp function being equal to the separation between the synchronization pulses. The signal pulses are coupled through a variable gain amplifier to a multichannel pulse height analyzer, the gain of the amplifier being a function of the slope of the ramp function. The multichannel pulse height analyzer drives an oscilloscope, thus providing a visual display of the declining curve representative of the signal pulses from the borehole instrument.

3,612,878

METHOD AND APPARATUS FOR MEASURING THE RADIANT ENERGY REFLECTANCE OF MATERIALS

Keith E. Nelson, Rolling Hills Estates, Calif., assignor to TRW Inc.

Continuation of application Ser. No. 385,227, July 27, 1964, now abandoned. This application Nov. 15, 1968, Ser. No. 776,282
Int. Cl. G01n *21/22, 21/48*
U.S. Cl. 250—83.3 H **10 Claims**



To provide a method and apparatus for measuring reflectances independent of the sample temperature, the sample is alternately irradiated by hot and cold radiation which is picked up by one or more detectors.

3,612,879

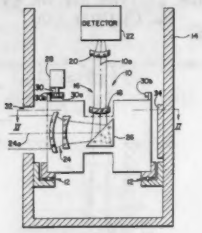
INFRARED SCANNER WITH REFERENCE HEAT SOURCE MOUNTED PERIPHERALLY OF ROTATIONAL OPTICAL SYSTEM

Claes Thomas Ohman, Taby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Dec. 1, 1969, Ser. No. 881,128
Claims priority, application Sweden, Nov. 29, 1968, 16281/68
Int. Cl. H01j *3/00*
U.S. Cl. 250—83.3 H **5 Claims**

A line scanner for infrared radiation includes a rotatable unit including an optical system which transmits received

radiation to an infrared detector during a scanning period determined by an aperture in the wall of a housing for the unit. A reference heat source in the form of a metallic plate



is mounted on the interior wall of the housing peripherally of the rotatable unit so that the radiation produced thereby passes through the entire optical system during scanning by the system.

3,612,880

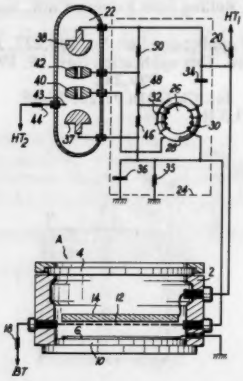
METHOD OF SPARK CONTROL AND SYSTEMS FOR THE UTILIZATION OF SAID METHOD IN SPARK CHAMBERS

Alain Lansiart, 34, avenue Saint-Laurent-91, Orsay; Jean Leloup, 4, rue du Clos-91, Gif-sur-Yvette; Jean-Pierre Morucci, 5, Residence de Villebon-91, Villebon-sur-Yvette, and Georges Roux, 95, avenue Foch-78, Chatou, all of France

Continuation-in-part of application Ser. No. 592,828, Nov. 8, 1966, now abandoned. This application Dec. 23, 1968, Ser. No. 786,339

Int. Cl. G01t *1/205*

U.S. Cl. 250—83.6 R **12 Claims**



A spark quenching device for a three-electrode spark chamber in which a discharge device is associated in parallel with the intermediate-electrode/anode space of the spark chamber and a trigger device is controlled by the spark chamber current.

3,612,881

RELATIVE MOVEMENT DETECTOR

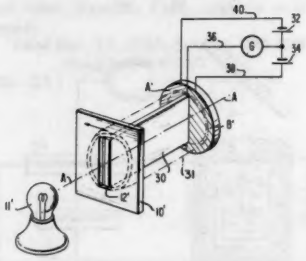
Paul B. King, Mountain Lakes, N.J., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Apr. 14, 1969, Ser. No. 815,886

Int. Cl. G01b *15/00;* **G01j** *1/36*

U.S. Cl. 250—204 **16 Claims**

Relative movement is detected by directing light through an apertured baffle to form a beam which strikes a pair of adjacent photosensitive devices. Transverse relative movement of the baffle moves the beam to change the relative amount of light striking the photosensitive elements to generate a signal indicative of the displacement of the baffle. A beam-



splitting shield may be located between the baffle and the photosensitive elements to increase the sensitivity of the apparatus.

3,612,882

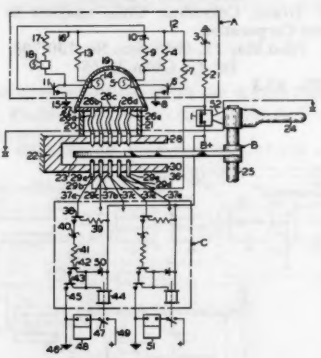
CONTROL APPARATUS USING FIBER OPTICS AND HAVING DEENERGIZED LIGHT SOURCE WHEN HANDLE IS IN A NEUTRAL POSITION

Charles W. Sheppard, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sept. 2, 1969, Ser. No. 854,685

Int. Cl. G02b *5/14;* **H01h** *47/24;* **H01j** *39/12*

U.S. Cl. 250—208 **3 Claims**



A photoresponsive control for use as a vehicle brake and propulsion control means whereby a light from a source is transmitted by fiber optic tubes to a manually operated control plate having variously located slotted openings to permit the light to selectively beam on or be shielded from various photoresponsive sensors which in turn control variations in the resistance of different control circuits and effect selection and functioning of various brake and propulsion controls of said vehicle.

3,612,883

RESONANT CAVITY PHOTON SENSOR COMPRISING SEMICONDUCTOR MATERIAL SANDWICHED BETWEEN TWO LAYERS OF DIELECTRIC

Norman E. Pedersen, Wilmington, Mass., assignor to Avco Corporation, Cincinnati, Ohio

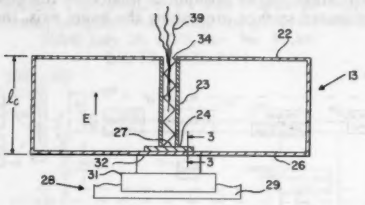
Filed Feb. 28, 1969, Ser. No. 803,347

Int. Cl. H01j *39/12;* **H01p** *7/06;* **H03c**

U.S. Cl. 250—211 **10 Claims**

The invention relates to a sensor which uses a semiconductor material which responds to photons to produce electron-hole pairs. The semiconductor operates in combination with a microwave cavity. The presence of an electron and/or hole

in the semiconductor is sensed by a change in capacitance of the resonant cavity. The result is a signal output from the



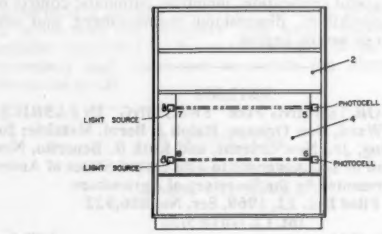
resonant cavity. A novel approach to bringing a photon to the semiconductor is described and optimum sensor parameters cited.

3,612,884

FAIL-SAFE PHOTOELECTRIC CONTROL SYSTEM

Stathis G. Linardos, Clearwater; Richard F. Elmhurst, Largo, and William A. Elmhurst, Largo, all of Fla., assignors to The Eastern Company, Portland, Maine

Filed Feb. 28, 1969, Ser. No. 803,249
Int. Cl. G02f *1/28*
U.S. Cl. 250—214 **8 Claims**



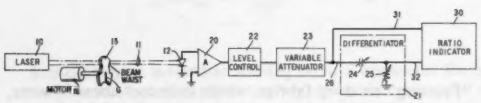
A fail-safe photoelectric control system for disconnecting a load whenever an object is sensed by one of two or more photocells. A transistorized gating circuit is connected to the photocells and to a square-wave output signal of a signal generator. Under normal conditions, the gating circuit passes the signal which is then amplified and rectified before energizing a relay which connects the load. When an object is in the light path of either photocell, or if any active component in the system fails, the signal is blocked whereupon the relay is deenergized and the load disconnected.

3,612,885

GAUSSIAN LASER BEAM-WAIST RADIUS MEASURING APPARATUS

Jacques A. Arnaud, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 10, 1969, Ser. No. 883,696
Int. Cl. G02f *1/28*
U.S. Cl. 250—217 **9 Claims**



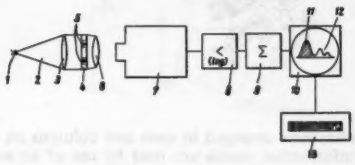
The beam-waist radius of a Gaussian laser beam is measured electronically. This is accomplished by periodically interrupting the laser beam to generate pulsive signals representative of its total power, differentiating the pulsive signals and then taking the ratio of the peak amplitudes of the pulsive signals and the corresponding differentiated signals. The beam-waist radius is proportional to the product of the differentiator time constant and the ratio of the peak amplitude of the pulsive signals to the peak amplitude of the differentiated signals.

3,612,886

PROCESS FOR THE QUANTITATIVE DETERMINATION OF LIGHT-ABSORBING OR LIGHT-REFLECTING SUBSTANCES DISTRIBUTED ON A CARRIER

Kurt Hannig, Schillerstrasse 46, Munich, 15, Germany

Continuation of application Ser. No. 681,271, Nov. 7, 1967, now abandoned. This application Feb. 4, 1970, Ser. No. 12,886
Int. Cl. G01n *21/22*
U.S. Cl. 250—219 QA **9 Claims**



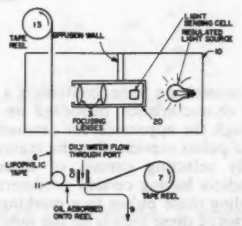
This invention relates to a process for the quantitative determination of light-absorbing or light-reflecting substances distributed on a carrier which comprises the steps of scanning line by line the distribution pattern of a substance selected from the group consisting of light-absorbing substances and light-reflecting substances distributed in a predetermined manner on a carrier, transforming the individual scanning points into current impulses corresponding with the optical densities of said substances, and integrating said current impulses belonging to a specific scanning line, whereby the optical densities of said substances are quantitatively determined.

3,612,887

RADIATION SENSITIVE OIL-IN-WATER DETECTOR

Gerard P. Canevari, Cranford, and William M. Bustin, Summit, both of N.J., assignors to Esso Research and Engineering Company

Filed May 16, 1967, Ser. No. 638,849
Int. Cl. G01n *5/02*
U.S. Cl. 250—219 Q **2 Claims**

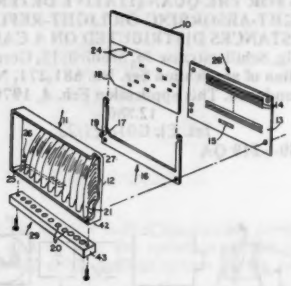


The invention covers a technique and apparatus for continuously monitoring a small amount of an effluent to immediately detect contaminants so that appropriate corrective measures may be promptly taken. A small, continuous sample of an aqueous effluent flows onto a moving tape of lipophilic fabric wherein any contaminant, such as oil, is adsorbed. The tape passes over a light source wherein the degree of light reflection is a function of the amount of any oil contaminant present.

3,612,888
INFORMATION MEDIA READING APPARATUS

Gerald Boucher, Hudson, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed July 10, 1968, Ser. No. 743,792
Int. Cl. G08c *9/06*
U.S. Cl. 250—219 D **16 Claims**

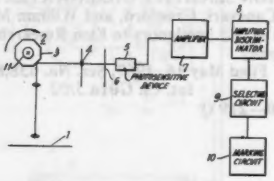


Data indications arranged in rows and columns on a card or other information media are read by use of an arrangement of a plurality of light sources, fiber optic conductors, and light sensors. The light sources are energized to sequentially read one card row at a time activating a selected photocell through unmasked fiber optic conductors. The light sources and conductor ends are aligned such that an aperture in the card will be read as a continuous light beam by a photocell for that position. Means are also provided to insure that the card is properly inserted into the card chamber.

3,612,889
APPARATUS FOR MARKING THE LOCATION OF INDICIA ON A FILM

Robert Andrew Diamond, Oxford, England, assignor to Vickers Limited, London, England

Filed July 31, 1968, Ser. No. 749,014
Int. Cl. G01n *21/30*
U.S. Cl. 250—219 R **7 Claims**



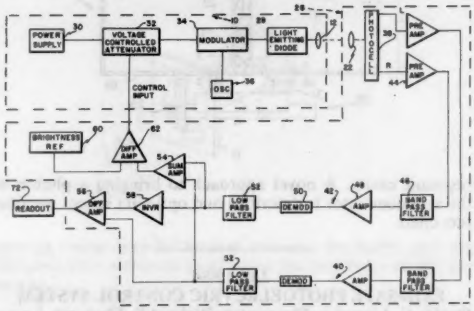
Apparatus for scanning a trace, containing a number of indicia of varying characteristics, deposited on a tape as the tape moves through the apparatus, for producing photoelectrically a series of pulses representing the scanned indicia and for electronically selecting certain of these pulses corresponding to indicia having certain predetermined characteristics and feeding these pulses to a marking device which marks the positions of these indicia on the tape.

3,612,890
RADIATION SENSITIVE OPTICAL GAGING SYSTEM

William S. Cornyn, Jr., Palo Verdes Peninsula; William Pennington, Jr., Los Angeles; Antone Potocnik, Palos Verdes Peninsula, and Wallace M. Porter, Redondo Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Oct. 13, 1969, Ser. No. 865,668
Int. Cl. G01b *7/04*
U.S. Cl. 250—222 **17 Claims**

An optical gaging system wherein a light beam is projected onto the surface of an object to illuminate the surface with a small light spot, and light rays emanating from the illuminated surface area by diffuse reflection are collected and focused at an observation station to produce at the station a light-spot image whose position is related to the position of the illuminated surface area along the beam axis. the image

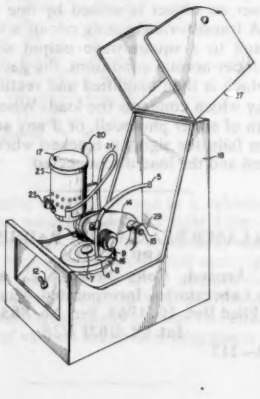


position is sensed electrically and converted to a corresponding electrical position signal. The gaging system is capable of a variety of useful applications including automatic control of machining operations, dimensional measurement, and surface contour or profile gaging.

3,612,891
DEVICE FOR TESTING FOR "FROSTING" IN FABRICS

Truman L. Ward, New Orleans; Ralph J. Berni, Metairie; Julius R. Jung, Jr., New Orleans, and Ruth R. Benerito, New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture

Filed Dec. 22, 1969, Ser. No. 886,922
Int. Cl. G01n *3/56*
U.S. Cl. 250—222 **3 Claims**

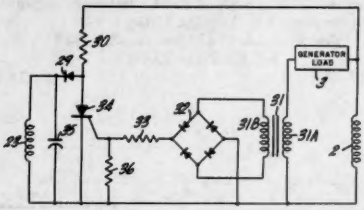


"Frosting" on dyed fabrics, which indicates abrasive wear, is measured by abrading a rotating sample of fabric in a closed chamber, illuminating the abraded area, and scanning the illuminated area with a photoelectric sensing device. The signal generated by the latter is fed into recording means. Graphic evaluation of a plurality of fabrics compares favorably with subjective evaluation of the same fabrics by accepted methods. Reproducibility of measurement is excellent.

3,612,892
MOTOR GENERATOR WITH AUTOMATIC SPEED AND IDLING CONTROL

Robert Nobile, Tarreyton, N.Y., and Joseph B. Gag, Stamford, Conn., assignors to Textron, Inc., Providence, R.I.

Filed July 30, 1970, Ser. No. 59,447
Int. Cl. H02p 9/04
U.S. Cl. 290—40 8 Claims



An automatic control for an internal combustion engine driving an alternating current electric generator supplying a variable and intermittent load comprises a speed responsive governor controlling the throttle of the engine to maintain it at a constant operating speed as long as there is load on the generator regardless of the amount of load and an automatic override which reduces the engine speed to a selected idling speed when there is no load on the generator. The override is effected by an electromagnetic device controlled by a circuit comprising a current transformer having a primary winding in series with the generator load and a silicon-controlled rectifier controlled by the rectifier output of the transformer secondary and connected to switch the electromagnetic device on or off.

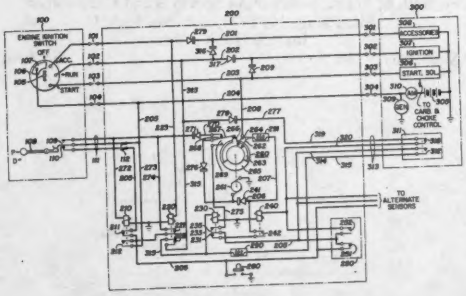
ERRATUM

For Class 290—52 see:
Patent No. 3,612,598

3,612,893
AUTOMATIC START CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

James G. Gallagher, 8313 West Blvd. Drive, Alexandria, Va.

Filed Mar. 18, 1970, Ser. No. 20,629
Int. Cl. F02n 11/00
U.S. Cl. 290—37 16 Claims

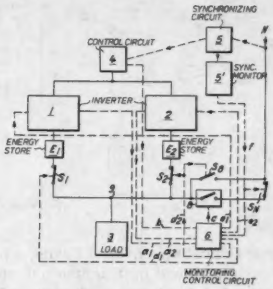


Self-contained automatic starting control apparatus for internal combustion and other engines operable responsive to predetermined environmental conditions such as temperature precipitation, light, time and the like, and to external influences such as a radio signal. The apparatus provides for the control of all equipment accessory to the engine, its automatic turnoff responsive to other environmental predetermined conditions and external conditions, and for the prevention of the unauthorized use of the engine or its vehicle after an automatic engine start.

3,612,894
AC SUPPLY SYSTEM

Jurgen Schmidt, Belecke, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed July 13, 1970, Ser. No. 54,547
Claims priority, application Germany, July 11, 1969, P 19 35 206.8
Int. Cl. H02j 9/06
U.S. Cl. 307—60 9 Claims

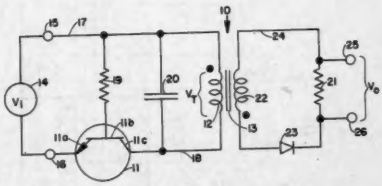


The voltage stability of an AC supply system having a plurality of AC current supply assemblies connected in parallel to a common load is improved when a malfunction is detected in one of the current supply assemblies by first connecting the load to a standby AC main with which the current supply assemblies are synchronized, disconnecting the malfunctioning current supply assembly from the load, and, after adjusting the properly functioning current supply assemblies to supply the total power output prior to the malfunction, disconnecting the load from the standby AC main.

3,612,895
PULSE COUPLING CIRCUIT

Janis M. Niedra, Fairview Park, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Aug. 11, 1969, Ser. No. 849,106
Int. Cl. H03k 17/80
U.S. Cl. 307—88 MP 12 Claims

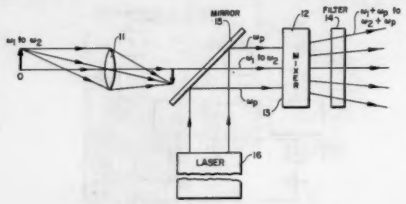


A switch, such as a transistor, is interposed between a pulse generator and a winding of an inductor, a load being coupled to the inductor. The switch isolates the inductor from the pulse generator at the end of each pulse causing a partial cycle L-C oscillation in the inductor to reset its core. A capacitor may be connected across the inductor winding. To dissipate some energy, a resistor may be connected in series with the capacitor. The voltage across the inductor winding may be limited by a diode and a zener diode serially connected across the winding. Critical damping of the L-C oscillation is obtained by connecting the resistor and the capacitor in parallel with the zener diode. Two such circuits may be doubled up in back-to-back relationship to energize two individual loads or one single load.

3,612,896
ACHROMATIC OPTICAL UPCONVERTER

Arthur H. Firester, Kendall Park, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed May 15, 1970, Ser. No. 37,645
Int. Cl. H03f *7/04*
U.S. Cl. 307—88.3 8 Claims

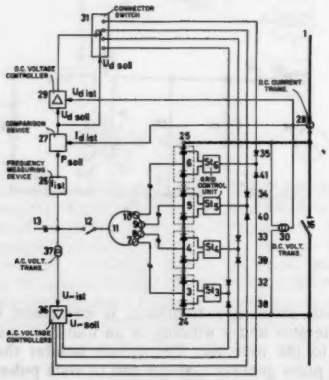


An achromatic optical upconverter having a pump source, an object source, a nonlinear optical material, and a filter for passing the sum of the pump and object frequencies. A lens, which forms a real image of the object, directs the object rays toward the entrance face of the nonlinear material. A dichroic mirror or beam splitter mounted in the path of the object rays pass the object rays and reflect the pump rays toward the entrance face of the nonlinear material. The lens and the nonlinear material are spaced along the optical axis a distance such that chromatic abberations caused by the lens are eliminated by the nonlinear material which produces an equal and opposite effect and vice versa.

3,612,897
ARRANGEMENT FOR TAPPING THE DC LINK OF A HIGH-VOLTAGE DIRECT CURRENT TRANSMISSION SYSTEM

Karl-Werner Kanngiesser, Viernheim, Germany, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Dec. 1, 1969, Ser. No. 881,162
Claims priority, application Germany, Dec. 11, 1968, P 18 13 853.9
Int. Cl. H02j *1/00*
U.S. Cl. 307—87 11 Claims

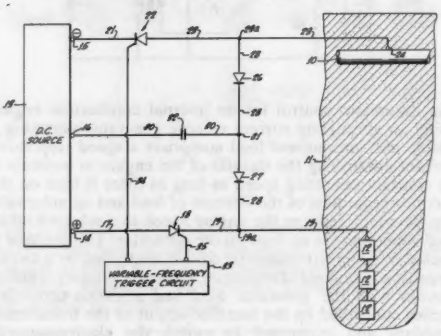


An arrangement for tapping the DC link of a high-voltage direct-current transmission system which comprises at least two series-connected auxiliary converters and power transformer means, wherein each auxiliary converter is controlled by a grid control unit. The grid control units are either controlled by the outputs of an AC-voltage controller and a DC-voltage controller or by the output of the DC-voltage controller only. The output of the AC-voltage controller is simultaneously applied to the input terminals of the grid control units and the output of the DC-voltage controller is successively applied to the input terminals of the grid control units by means of a controlled connector switch.

3,612,898
PULSED CATHODIC PROTECTION APPARATUS AND METHOD

Thaddeus M. Doniguian, Laguna Beach, and Harry J. Kipps, South Laguna Beach, both of Calif., assignors to Signal Oil and Gas Company, Los Angeles, Calif.

Filed June 24, 1969, Ser. No. 835,946
Int. Cl. B01d *13/02*
U.S. Cl. 307—95 5 Claims

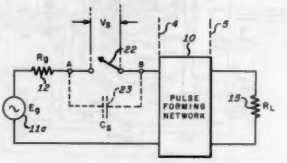


A pulsed cathodic protection apparatus and method in which charging of the capacitor means is through the earth between an anode bed and the pipe or other element to be protected, thereby eliminating the need for any resistor in the charging circuit. The apparatus and method effect voltage doubling, and are capable of achieving relatively high-frequency operation. In one embodiment, a circuit is provided for a center-tapped voltage source, whereas a second embodiment relates to a circuit for a voltage source which is not center-tapped.

3,612,899
GENERATOR FOR SHORT-DURATION HIGH-FREQUENCY PULSE SIGNALS

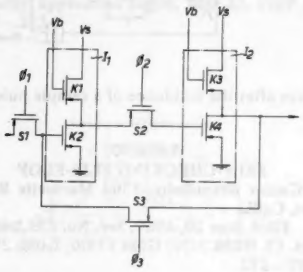
Gerald F. Ross, Lexington, and Joseph D. De Lorenzo, Sudbury, both of Mass., assignors to Sperry Rand Corporation

Filed Aug. 20, 1970, Ser. No. 65,551
Int. Cl. H03k *3/64*
U.S. Cl. 307—106 6 Claims



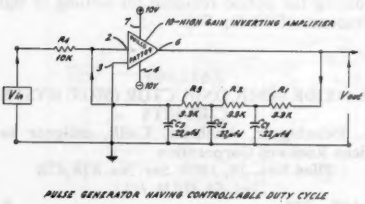
Very narrow pulses of high-frequency sine wave electromagnetic energy are formed by use of a gated or pulse modulated continuous-wave source feeding a transmission line network having a time-limited impulse response and adjusted to provide a series resonance with the leakage capacity of the source gating or modulating switch for the purpose of assuring that a maximum of the available energy is employed to form the output and that the output level is nulled before and after the generation of the high-frequency pulse.

3,612,900
SHIFT REGISTER CIRCUIT
Richard Davies, Timperley, England, assignor to Ferranti, Limited, Hollinwood, England
Filed Oct. 20, 1969, Ser. No. 867,834
Claims priority, application Great Britain, Nov. 8, 1968, 53,001/68
Int. Cl. G11c 19/00
U.S. Cl. 307—221 10 Claims



A shift register circuit is connected so that it operates as a three-phase static shift register at low frequencies and as a two-phase dynamic shift register at high frequencies. The transition is achieved by producing a train of switching pulses having an amplitude dependent upon the pulse repetition rate of the two pulse trains from which they are derived, and using these variable-amplitude pulses to allow or prevent the operation of the shift register as a three-phase static circuit.

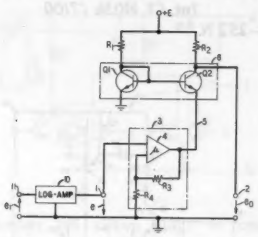
3,612,901
PULSE GENERATOR HAVING CONTROLLABLE DUTY CYCLE
James M. Loe, Willow Grove, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.
Filed Dec. 29, 1969, Ser. No. 888,430
Int. Cl. H03k 3/64
U.S. Cl. 307—106 10 Claims



PULSE GENERATOR HAVING CONTROLLABLE DUTY CYCLE

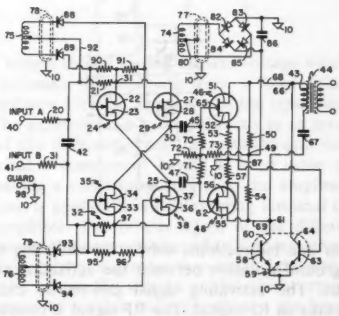
A pulse generator responsive to a single input signal for producing a fixed frequency pulse output signal, the duty cycle (pulse width) of which is proportional, at any instant, to the amplitude of said input (modulating) signal. The generator comprises a high gain inverting amplifier whose output is connected to its input via three phase shifting stages, each comprising a series resistor and a shunt capacitor. The modulating signal is applied to the input of the amplifier via an isolating resistor. In absence of a modulating signal, the generator oscillates at a fixed frequency, producing an output pulse train having a 50 percent duty cycle. The modulating signal changes this duty cycle by (1) opposing the discharge of the shunt capacitor of the third delay stage when said capacitor is charged in one direction, and (2) aiding its discharge when it is charged in the opposite direction.

3,612,902
TEMPERATURE-INDEPENDENT ANTILOGARITHM CIRCUIT
Richard L. Moose, Burlington, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Oct. 16, 1968, Ser. No. 767,979
Int. Cl. G06g 7/24
U.S. Cl. 307—229 6 Claims



A circuit for obtaining an output voltage proportional to the antilogarithm of an input voltage. The circuit is made insensitive to temperature variations by constructing its two transistors as an integrated structure on the same substrate so that they are made of the same materials, by the same process and with a very close thermal coupling. This construction insures that all the critical parameters of the transistors, particularly the ratio of the reverse saturation currents of the base-emitter junctions, are stabilized against temperature changes.

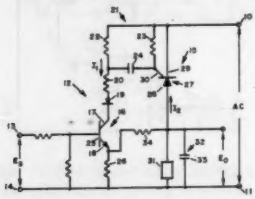
3,612,903
FLOATING DIFFERENTIAL ELECTRONIC CHOPPER
James D. Lynn, and Marion J. Langan, both of Huntsville, Ala., assignors to Avco Corporation, Huntsville, Ala.
Filed Feb. 9, 1970, Ser. No. 9,491
Int. Cl. H03k 17/60
U.S. Cl. 307—251 11 Claims



Herein described is a floating chopper comprising a pair of normally conductive N channel-junction field effect transistors, gated off in phase and a second pair of normally conductive N channel-junction transistors likewise gated off in phase, but with a phase delay of 180°, these four transistors being employed as switching devices alternately to present to a pair of output terminals the potentials existing at a pair of input terminals. There being a polarity reversal at these output terminals during each transition in the gating waveform, there appears at such output terminals a square waveform double in voltage magnitude to the potential differential between the input terminals. An impedance transformation network converts the derived square wave signals to low-impedance signals utilized to drive an output transformer. The chopper circuit is floating with respect to the system output ground and means is provided to balance the

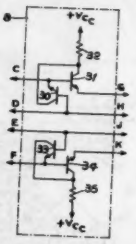
chopper circuit without creating a leakage path between the differential signal and the output ground.

3,612,904
SWITCHING CIRCUIT
John L. Moe, Winona, Minn., assignor to Waynco, Inc., Winona, Minn.
Filed Feb. 20, 1969, Ser. No. 800,958
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 N **13 Claims**



A controllable hysteresis is introduced into a switching circuit to provide a differential between the signal level required to turn the circuit "on" and "off."

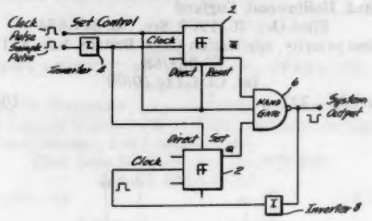
3,612,905
SOLID-STATE BIDIRECTIONAL SWITCHING CIRCUIT
Charles R. Cook, Jr., North Palm Beach, Fla., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed Dec. 13, 1968, Ser. No. 783,480
Int. Cl. H03k *17/00*
U.S. Cl. 307—254 **9 Claims**



This is a bidirectional solid-state switching circuit having DC ground isolation between the activating signal and the output. The activating signal powers an oscillator which generates an RF signal. The RF signal is coupled to two detectors by two very small capacitors which establishes the DC ground isolation. When an RF signal is present, the detectors provide the proper biasing to turn on two transistors which are connected in parallel wherein the emitter and collector of the first transistor is connected to the collector and emitter of the second transistor respectively, the output being taken across the parallel combination.

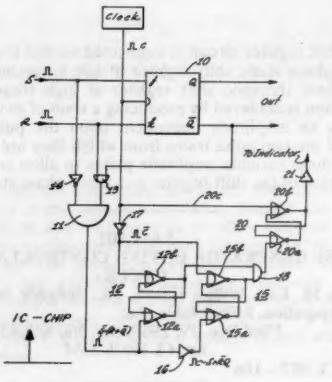
3,612,906
PULSE SYNCHRONIZER
Peter D. Kennedy, Casselberry, Fla., assignor to The United States of America as represented by the Secretary of the Navy
Filed Sept. 28, 1970, Ser. No. 76,142
Int. Cl. H03k *17/26*
U.S. Cl. 307—269 **3 Claims**

A pulse synchronizer employing two bistable flip-flops and a NAND gate is used to pass the first complete clock pulse



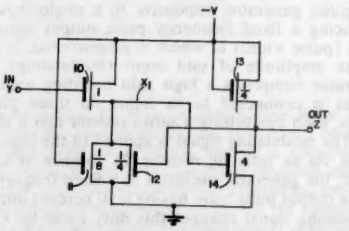
which arrives after the incidence of a sample pulse.

3,612,907
SELF-CHECKING FLIP-FLOP
Theodore Gustav Braunholtz, 1304 Marinette Road, Pacific, Palisades, Calif.
Filed June 20, 1969, Ser. No. 835,046
Int. Cl. H03k *5/20*; G06f *11/00*; G08b *29/00*
U.S. Cl. 307—272 **8 Claims**



A supervisory circuit is disclosed for use in conjunction with a clocked flip-flop to determine whether inputs thereof change during the period required for settling of signals for proper response of the flip-flop.

3,612,908
METAL OXIDE SEMICONDUCTOR (MOS) HYSTERESIS CIRCUITS
Gary L. Heimbigner, Anaheim, Calif., assignor to North American Rockwell Corporation
Filed Nov. 20, 1969, Ser. No. 878,478
Int. Cl. H03k *1/12*
U.S. Cl. 307—279 **8 Claims**



The invention is directed to circuits which have positive feedback operation to shift the input trigger point of the cir-

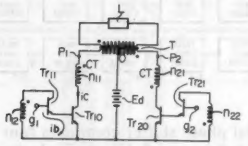
cuit to a new value, depending upon what the last bonafide input logic level was. The spread between the two trigger levels is set by the initial design with some adjustment of the spread being achieved by an external control input. The circuits are applicable to N or P channel MOS devices.

3,612,909

TRANSISTORIZED SWITCHING CIRCUIT

Hirosuke Imabayashi, Ise, Japan, assignor to Shinko Electric Co., Ltd., Tokyo, Japan

Filed June 8, 1970, Ser. No. 44,027
Claims priority, application Japan, June 23, 1969, 44/49778
U.S. Cl. 307—282 **3 Claims**



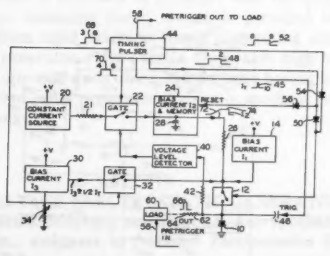
A transistorized circuit for providing switching action includes main switching transistors and prestage transistors. The circuit also includes a multiwinding current transformer, the primary windings of which are connected in the main switching circuit so that the secondary outputs of the current transformer may be used to obtain driving sources for the prestage transistors. In a preferred embodiment, driving currents sufficient to cause the main switching transistors to full-saturate are always supplied to the prestage transistors by back-to-back diode circuits.

3,612,910

TRIGGERED PULSE GENERATOR HAVING AUTOMATIC BIAS ADJUSTMENT

Clarence E. Cowan, Newberg, and George J. Frye, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed July 28, 1970, Ser. No. 58,884
Int. Cl. H03k *3/315*
U.S. Cl. 307—286 **9 Claims**



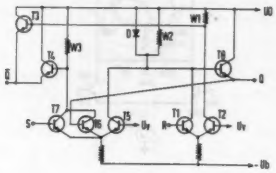
A triggered pulse generator circuit is described including a tunnel diode or other negative resistance device connected as a bistable switching circuit whose forward bias is automatically adjusted to the proper arming level between trigger pulses. A ramp bias current is applied to the tunnel diode along with a fixed bias current until it switches to a high-voltage state and actuates a voltage level detector. The detector output stops the ramp and causes a memory capacitor to store the maximum ramp current which is added to the fixed bias current to provide an arming current corresponding to the peak current of such tunnel diode minus a predetermined bias current related to the amplitude of the trigger pulse. After the device is reset, the stored arming current is again applied thereto to enable a subsequent trigger pulse to trigger the device and produce an output pulse.

3,612,911

ASYNCHRONOUS RS SWEEP STAGE IN ECL TECHNIQUE

Friedrich-Karl Kroos, Soecking, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 6, 1970, Ser. No. 61,768
Int. Cl. H03k *3/26*
U.S. Cl. 307—289 **3 Claims**



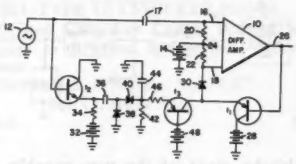
An asynchronous RS sweep stage in emitter-coupled technique utilizes emitter follower output circuits and a retroactive path to decrease pulse application and pulse duration time.

3,612,912

SCHMITT TRIGGER CIRCUIT WITH SELF-REGULATED ARM VOLTAGE

John B. Schwartz, Abington, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 14, 1970, Ser. No. 2,701
Int. Cl. H03k *5/20, 3/26*
U.S. Cl. 307—290 **6 Claims**



A Schmitt trigger circuit having an arm voltage which automatically increases in amplitude from a fixed minimum value in accordance with the amplitude of the input signal to the circuit. The input signal is applied directly to an inverting input terminal of a differential amplifier and the arm voltage, which comprises a component having a fixed value and a component having a value proportional to the amplitude of the input signal, is applied to a noninverting terminal of the differential amplifier. The output signal of the differential amplifier removes the arm voltage when the instantaneous value of the input signal is greater than that of the arm voltage and thereby causes the voltage at the noninverting terminal to decrease to a value corresponding to the base line value of the input signal.

3,612,913

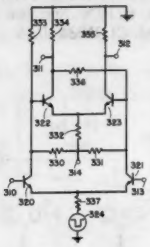
DIGITAL CIRCUIT

Rikio Maruta, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Feb. 17, 1969, Ser. No. 799,745
Claims priority, application Japan, Feb. 17, 1968, 43/9889
Int. Cl. H03k *3/295*
U.S. Cl. 307—290 **5 Claims**

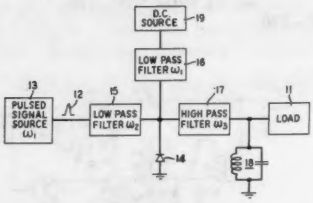
A digital circuit is described for operation with transistors in the unsaturated state. A first pair of transistors are connected in differential relationship and provided with a single resistive positive feedback circuit. A second pair of transistors also connected in differential relationship have their collectors respectively coupled to the bases of the first pair of transistors. A source of clock pulses is coupled to the common emitters of the second pair to render the transistors

in the first and second pair selectively conductive in correspondence with signals applied to the input bases of the



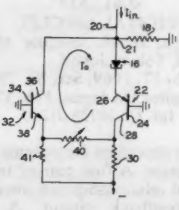
second pair of transistors. Several embodiments and applications are described.

3,612,914
AVALANCHE DIODE CIRCUITS
William Joshua Evans, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Aug. 25, 1970, Ser. No. 66,823
Int. Cl. H03k *335*
U.S. Cl. 307—285 **6 Claims**



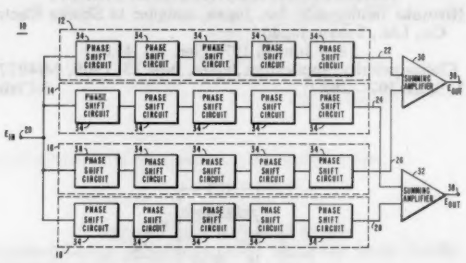
An avalanche diode of the type capable of generating Trapatt mode oscillations is used for generating extremely sharp output voltage spikes. An externally applied input pulse has a current density of $J_T > qv_sN$, where v_s is the saturated drift velocity and N is the impurity concentration of majority carriers in the high-resistance layer of the diode. The output spikes can be used for high speed gating, pulse regeneration, or harmonic generation.

3,612,915
TRIGGERABLE APPARATUS
George J. Frye, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed May 26, 1969, Ser. No. 827,568
Int. Cl. H03k *17/00, 3/26*
U.S. Cl. 307—290 **13 Claims**



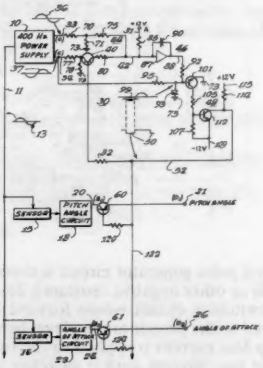
A Schmitt trigger circuit comprises a tunnel diode in series with a transistor amplifier, with a load resistor shunted across the series combination. The output of the transistor amplifier is coupled in positive feedback relation to the tunnel diode.

3,612,916
DIFFERENTIAL PHASE SHIFTER
Daniel R. O'Neill, 28019 Hazelridge Drive, Palos Verdes Peninsula, Calif.
Filed July 29, 1970, Ser. No. 59,070
Int. Cl. H03k *1/16*
U.S. Cl. 307—295 **10 Claims**



A differential phase shifter comprises four phase shift networks connected in parallel to a single input. Each phase shift network includes five series connected phase shift circuits comprising a bipolar transistor with a resistor and capacitor connected in series between the collector and emitter. The transistor base provides a high impedance input and the common junction between the resistor and capacitor provides an output of each phase shift circuit. Different pairs of phase shift networks are connected to each of two summing amplifiers which provide the differential outputs. When the components of each phase shift circuit are chosen to form a proper relationship the differential phase shift between the two outputs is maintained very nearly constant over a very broad frequency range.

3,612,917
CONTROL CIRCUIT FOR COMPENSATING FOR POWER VARIATIONS UTILIZING CONTROLLED MULTIPLIERS OR DIVIDERS
James A. Sutcliffe, Redmond, and Robert K. Kirschner, Bellevue, both of Wash., assignors to Sundstrand Data Control, Inc.
Filed June 26, 1969, Ser. No. 836,743
Int. Cl. G05d *3/00*
U.S. Cl. 307—297 **12 Claims**



An AC power supply powers several transducer circuits, in which input voltage variations cause variations in the output signals from the transducer circuits. A time division multiplier has an input connected to the AC power supply and a second input connected to a fixed DC voltage source. Variation in AC amplitude change the duty cycle of pulses generated by the multiplier. Semiconductor detector gates are driven by the multiplier pulses in order to demodulate

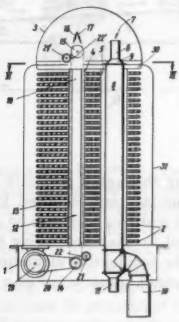
and divide the output signals of the transducer circuits by a factor proportional to the duty cycle, thereby compensating for variations from the AC power supply.

3,612,918

ELECTROSTATIC HIGH-TENSION BELT GENERATOR

Kurt Willutzki, Tubingen, Germany, assignor to ITF Induktive Technische Forchung GmbH, Dusseldorf, Germany

Filed Jan. 15, 1969, Ser. No. 791,374
Claims priority, application Germany, Jan. 19, 1968, P 16 38 220.0
Int. Cl. H02n *1/12*
U.S. Cl. 310—6 **24 Claims**



An endless running belt or insulating thread of an electrostatic high-tension belt generator forms a belt or insulating thread wall of plural parallel coils over a path between guide rollers and diverting rollers with respect to which opposite charging roller means and diffusion electrodes are provided. An insulating wall interconnects the guide rollers in an exchangeable construction unit and potential rings are formed of hard foam material having a metallic conductive cover particularly of a wrapping of aluminum foil. Annular plate-formed supports are engaged centrally by sparking distance spacer means and peripherally engage the potential rings like a clamp to avoid damage of potential ring surface in case of disturbance. A particle accelerator exemplified by a discharge tube is provided in passages with the generator and a tubular insulating lining means is provided in said passages to form rigid machine frame connecting elements between the generator socket and a removable high-tension electrode on opposite ends of an airtight liner having beaded edges and filled with pressurized gaseous medium of high dielectric strength.

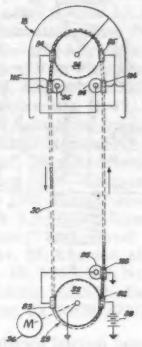
3,612,919

HIGH-VOLTAGE ELECTROSTATIC GENERATOR

Raymond G. Herb, Madison, and James A. Ferry, Middleton, both of Wis., assignors to National Electrostatics Corp., Middleton, Wis.

Filed May 29, 1969, Ser. No. 829,066
Int. Cl. H02n *1/00*
U.S. Cl. 310—6 **24 Claims**

A high voltage is developed by conveying electrostatic charges to a high-voltage electrode, by means of an endless conveyor chain comprising conductive links alternating with insulating links. The conductive links comprise cylindrical pellets with cylindrical openings extending axially therein. The insulating links have enlarged spherically rounded end portions swingably received in the cylindrical openings. Pivot pins extend between the enlarged end portions and the cylindrical pellets. The conveyor is trained around wheels having spring contactors thereon for transferring charges to and from the pellets. Channel-shaped induction electrodes are positioned opposite the conveyor where it makes and breaks contact with the wheels. Operating voltages for some of the induction electrodes are obtained by idler pulleys contacting the conveyor. Each idler pulley preferably has one or more



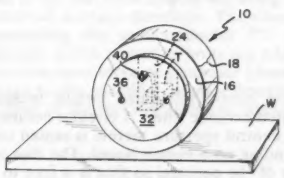
spring contactors thereon for engaging the pellets. Additional induction electrodes are preferably provided opposite the idler pulleys.

3,612,920

WHEEL-TYPE TRANSDUCER PROBE

Walter J. Bantz, and Chan-Koo Chung, both of Stamford, Conn., assignors to Branson Instruments, Incorporated, Stamford, Conn.

Filed Oct. 5, 1970, Ser. No. 77,877
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.1 **9 Claims**



A wheel-type ultrasonic transducer probe comprises a hub portion and a rotatable rim portion, both made of substantially rigid thermoplastic material. The probe is dimensioned to be useful for thickness gauging and to this end is constructed to cause the ultrasonic signal to transverse equal distances in the hub portion and rim portion.

3,612,921

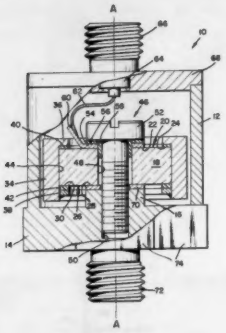
ANNULAR SHEAR ACCELEROMETER

Dan L. Springate, Temple City, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Mar. 27, 1969, Ser. No. 811,120
Int. Cl. H04r *17/00*
U.S. Cl. 310—8.4 **10 Claims**

A shear accelerometer characterized by its clamping

means securing an annular piezoelectric element to both the accelerometer's base and inertial members, thereby avoiding the utilization of interfacial bonding media.

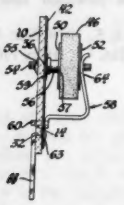


3,612,922

METHOD OF MOUNTING A PIEZOELECTRIC DEVICE

Thomas J. Furnival, Logansport, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1970, Ser. No. 88,455
Int. Cl. H01v 7/00
U.S. Cl. 310—9.1 3 Claims



A thick film hybrid integrated circuit including an integrally mounted ceramic filter. A circular ceramic resonator disk having a central aperture therein is seated on a pedestal contact upstanding on a circuit board. The disk is supported on a shoulder of the pedestal so that it is free to resonate in the radial mode. A spring contact secured to the board contacts the exposed face of the disk to retain the disk against the pedestal shoulder.

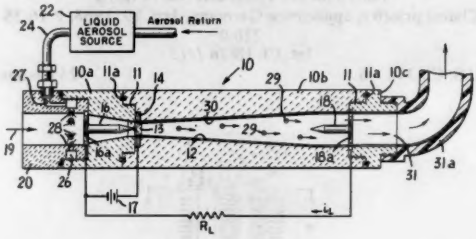
3,612,923

ELECTROGASDYNAMIC CONVERTER WITH RESISTIVE CHANNEL

Edward L. Collier, Morris Plains; Meredith C. Gourdine, West Orange, and Harold W. McCrae, Upper Montclair, all of N.J., assignors to Gourdine Systems, Inc., Livingston, N.J.

Filed Oct. 5, 1967, Ser. No. 673,078
Int. Cl. H02n 3/00
U.S. Cl. 310—10 21 Claims

An electrogasdynamic converter operating on a gaseous stream of the type including a flow channel having ionizing electrode means in an upstream portion to produce charges in the stream, and collector electrode means spaced downstream from the ionizing electrode means to neutralize the charges carried in the downstream direction by the flow. The converter is operated to establish in the intermediate section of the flow channel between the ionizing electrode means and the collector electrode a high resistance path at the boundary of the flow path for charges carried in the stream. The high resistance may be formed by a thin liquid or solid film at the flow path boundary, or by spaced conductive elements extending through a dielectric channel to be flush with the flow boundary and exposed to the stream. In the latter event, a thin resistive film may be deposited on the outside of the channel to have successive sections thereof connected between the conductive elements. A third alternative utilizes a flow channel constructed of a highly resistive conducting material.

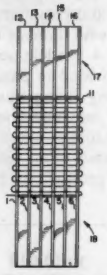


3,612,924

MASS LOADED MAGNETOSTRICTIVE TRANSDUCER

Adelbert Semmelink, Riverside, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Sept. 26, 1969, Ser. No. 861,376
Int. Cl. H01v 9/00
U.S. Cl. 310—26 3 Claims

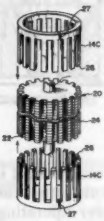


This device is a magnetostrictive transducer having several magnetostrictive elements spaced one from the other and having two end bodies, one mounted at each end of the magnetostrictive elements and attached to each magnetostrictive element so as to be moved by the contraction and expansion of the magnetostrictive elements. The mass of the end bodies is large compared to that of the magnetostrictive elements. A series of coils are wound around the magnetostrictive elements in such a way that when pulsating current is conducted through the coils, the magnetostrictive elements contract and expand in accordance with the strength of the pulsating current and move the end bodies. The magnetostrictive elements and end bodies resonate at a predetermined frequency and the pulsating current actuates the transducer at the frequency to give a greater power and efficiency to the transducer output.

3,612,925
INDUCTION MOTOR ROTOR AND METHOD OF MAKING SAME

Roy L. Swanke, Newington, Conn., assignor to Dynamics Corporation of America, New York, N.Y.

Filed Feb. 24, 1970, Ser. No. 13,341
Int. Cl. H02k 3/06
U.S. Cl. 310—42 11 Claims

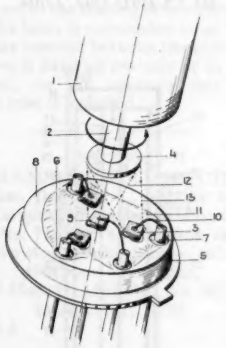


An induction motor rotor in which conducting bars and end rings are preformed ladderlike for insertion in the slots and the bars have the same circumferential widths as the lands of the laminated core between them and substantially the same radial thickness as the radial depth of the slots in which they rest. The bars are stamped without waste of material from heavy strip stock to provide interdigitating fingers whose length is at least 50 percent of the slot length and provide identical half-ladder units which are then shaped to the rotor slot pattern and inserted in the rotor slots where they are induction soldered for circuit continuity and conductivity.

3,612,926
PICKOFF DEVICE FOR ROTARY MACHINES

Walter Zizelmann, Alpirsbach, Germany, assignor to Licentia, Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Jan. 26, 1970, Ser. No. 5,499
Claims priority, application Germany, Jan. 31, 1969, P 19 04 791.7
Int. Cl. H02k 37/00
U.S. Cl. 310—46 9 Claims

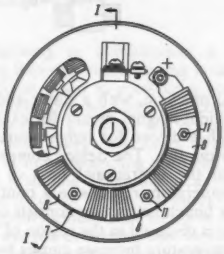


A pickoff device for a rotary machine in which radiation from a stationary radiation source is variably reflected by a reflector rotating with the rotor on to a stationary radiation sensor. A plurality of sensors may be provided and the radiation may be reflected successively on them. The outputs of the sensors may be used to control field windings where the machine is a direct current machine.

3,612,927
SEMICONDUCTOR RECTIFIER UNIT OF ELECTRIC GENERATOR

Pavel Mikhailovich Anisimov, Tkatskya ulitsa, 46, kv. 9, Moscow; Ivan Grigorievich Barannik, ulitsa Krasnostudencheskay, 8, kv. 16, Kherson; Pavel Gdanievich Berman, ulitsa Ushakova, 58, kv. 44, Kherson; Boris Ivanovich Evgrafov, ulitsa Chistye prudy, 9, kv. 8, Moscow; Jury Alexandrovich Kupeev, ulitsa 9 Rota, 15, kv. 11, Moscow; Alexandr Vasilievich Kurbatov, ulitsa Pecherskay, 27, kv. 7, Kuibyshev; Boris Davydovich Rafaevich, ulitsa Gagarina, 60, kv. 43, Kuibyshev; Rem Vladimirovich Stepnykh, ulitsa Gagarina, 84, kv. 8, Kuibyshev; Vsevolod Ilich Shakhovtsev, Scherbakovaskaya ulitsa 16/18, kv. 10, Moscow; Viktor Konstantinovich Judashkin, Samarskaya ulitsa, 148, kv. 23, Kuibyshev; Mikhail Stepanovich Reschuk, ulitsa Mira, 14, kv. 4, Kherson; Oleg Andreevich Guschenko, ulitsa Krasnokazarmennaya, 10, Kherson; Evgeny Ivanovich Kharchenko, ulitsa Oktyabrskoi revoljutsii, 6a, Kherson; Alexei Mikhailovich Ljubimov, Kamyshany, ulitsa Sovetskaya, 60, Kherson, and Pavel Grigorievich Kitsa, Zalaegerseg, 23-a, kv. 25, Kherson, all of U.S.S.R.

Filed Dec. 18, 1969, Ser. No. 886,197
Claims priority, application U.S.S.R., Dec. 19, 1968, 1291942
Int. Cl. H02k 29/02
U.S. Cl. 310—68 D 1 Claim

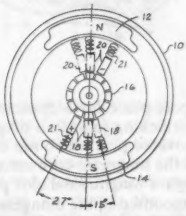


A semiconductor rectifier unit for an electric generator arranged in a three-phase full-wave rectification circuit, whose semiconductor rectifying elements are secured within metallic housings serving as heat transfer elements and located at the neutral point of PN circuits so that one of the PN junctions contacts the common housing with its P-region, while the other, with its N-region. The like leads of the PN junctions are connected to the current collecting bus bars arranged in two layers and interspaced by an insulating member, one of the bus bars directly adjoining the generator cover in electrical contact therewith. The common metallic housings containing the semiconductor PN circuits have openings through which mounting bolts are adapted to pass, which at the same time serve as generator phase leads applying AC voltage to the metallic common housings serving as the neutral point of the rectifier arms and to the external AC consumers.

3,612,928
SUBMERGED DC MOTOR

Charles B. Small, 213 Ohio St., Elyria, Ohio; Stephen G. Hokky, 5057 Evergreen Drive, North Olmstead, Ohio; Arthur G. Branch, 346 Columbia Road, Elyria, Ohio

Filed Mar. 19, 1970, Ser. No.21,151
Int. Cl. H02k 13/10
U.S. Cl. 310—87 4 Claims



A submerged DC Motor is provided wherein the centerline of the flux field of the armature and the stator are so

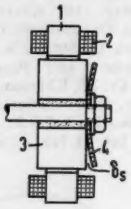
selected, and the thickness of the fluid film between the brushes and commutator is so selected to provide maximum brush life.

3,612,929

DEVICE FOR TEMPERATURE COMPENSATION IN ELECTRICAL MACHINES EXCITED BY PERMANENT MAGNETS

Wolfgang Volkrodt, Muhlbach, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Sept. 19, 1969, Ser. No. 859,284
Claims priority, application Germany, Sept. 26, 1968, P 17 88 066.9
Int. Cl. H02k *1/04*
U.S. Cl. 310—190 4 Claims



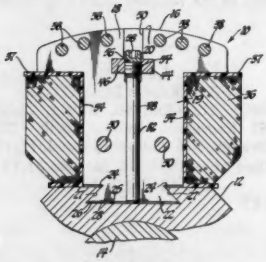
An electrical machine, with a stator and a rotor of which one has permanent-magnet means for exciting the machine, is provided with a device for temperature compensation of the magnetic stray flux. The device comprises bimetal structure subject to the operational heat of the machine and adapted to temperature-responsively control the stray flux. Preferably, the bimetal structure consists of one or more flat bimetal members disposed in the region of the magnetic stray flux so that temperature increase causes being of the bimetal member which then increases the width of an airgap to reduce the stray flux.

3,612,930

SALIENT FIELD POLE PIECE FOR DYNAMOELECTRIC MACHINES

Virgil W. Raby, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed July 17, 1970, Ser. No. 55,667
Int. Cl. H02k *1/28*
U.S. Cl. 310—218 2 Claims



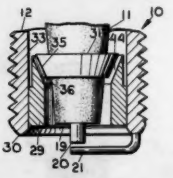
A salient field pole piece for a dynamoelectric machine is fastened in an interlocking joint to a magnetic core member by a series of removable pins which are clamped between an elongated bar and the magnetic core member. The elongated bar extends through a longitudinal slot provided in the pole piece and screws mounted in the elongated bar force the pins inwardly. The pole piece is pressed outward from the core member so that it is clamped along the interlocking joint.

3,612,931

MULTIPLE HEAT RANGE SPARK PLUG

William P. Strumbos, 85 Middleville Road, Northport, N.Y.

Filed Mar. 11, 1970, Ser. No. 18,615
Int. Cl. H01t *13/16*
U.S. Cl. 313—11.5 11 Claims



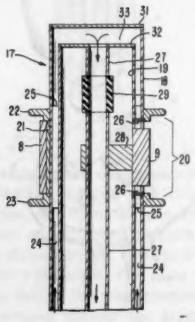
A spark plug incorporating a heat shunt on the plug insulator nose arranged such that the characteristics of a "hot" plug are provided at lower operating temperatures and of a "cold" plug at higher operating temperatures. The heat shunt is a thermally conductive ring bonded on the insulator nose. A thermal gap between the heat shunt and the shell of the plug prevents heat transfer through the shunt at lower operating temperatures—there is thus a relatively long heat path into the cooling system and the firing end of the plug stays relatively hot to prevent fouling. At higher operating temperatures, the heat shunt expands thermally to bridge the gap to thereby shorten the heat path into the cooling system so that the relatively rapid heat conduction "cools" the firing end of the plug to prevent its overheating under high speeds and loads. A method for fabricating the spark plug is given in which the plug insulator with the shunt bonded thereon is installed in the shell at the temperature at which the shunt is designed to have expanded into good thermal contact with the shell whereby the heat shunt gap is set substantially automatically. A method is also provided for monitoring the setting of the shunt gap during the manufacturing of the plug whereby a correlation is made between an energy level and thermal conduction in the shunting means.

3,612,932

CROSSED-FIELD MICROWAVE TUBE HAVING A FLUID COOLED CATHODE AND CONTROL ELECTRODE

Andrew S. Wilczek, Old Bridge, and Charles Gill, Newark, both of N.J., assignors to Varian Associates, Palo Alto, Calif.

Filed June 13, 1969, Ser. No. 832,901
Int. Cl. H01j *1/02, 23/04*
U.S. Cl. 313—32 5 Claims



A crossed-field microwave tube includes a generally cylindrical central electrode structure having an arcuate cathode emitter portion and a sector-shaped control electrode portion. The cathode emitter is carried in heat exchanging relation upon the outside of a double walled cathode support tube. The annular space between the double walls defines a cathode fluid coolant passageway. The control electrode is

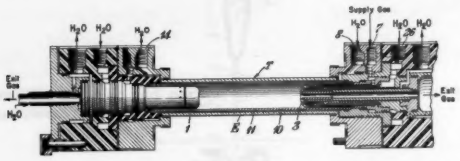
carried from a tubular support member centrally disposed of the cathode support tube. Fluid coolant passes in series through the control electrode support tube and the outer annular cathode coolant passageway. The control electrode support tube includes a tubular insulator defining a portion of control electrode coolant passageway.

3,612,933

METHOD AND APPARATUS FOR STABILIZING AN ARC

Harden Henry Troue, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 21, 1969, Ser. No. 878,775
Int. Cl. H01j *7/24, 17/26*
U.S. Cl. 313—32 5 Claims



A method and apparatus for stabilizing an arc established in an arc device having two axially spaced electrodes, at least one being a hollow electrode wherein a cooling fluid is passed along the outside surface of the hollow electrode at varying speeds to create a hot surface on the inside surface of said electrode which will form a zone from which the arc will not wander.

3,612,934

COLLECTOR FOR ELECTRON TUBES

Dominique Henry, Paris, France, assignor to Thomson-CSF

Filed Mar. 17, 1970, Ser. No. 20,208
Claims priority, application France, Mar. 28, 1969, 69/09365
Int. Cl. H01j *25/34*
U.S. Cl. 313—39 4 Claims

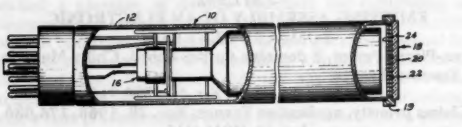
In order to improve the cooling of the collector of a traveling-wave tube, the latter is surrounded by an outer sleeve and insulating rods are inserted between the collector **30**, and the sleeve. The sleeve is fixed on one side of an intermediate insulating member, on the opposite side of which the remainder of the tube is mounted.

3,612,935

SELENIUM-SULFUR PHOTOCONDUCTIVE TARGET

Stanley A. Bynum, Dallas, Tex., assignor to General Electrodynamics Corporation, Garland, Dallas County, Tex.

Division of Ser. No. 718,012, Apr. 1, 1968, abandoned, which is a continuation of application Ser. No. 467,268, June 28, 1965, now abandoned.
Filed Mar. 17, 1969, Ser. No. 807,536
Int. Cl. H01j *31/28*
U.S. Cl. 313—65 A 3 Claims



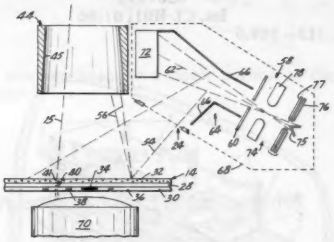
A photoconductive device made of a mixture of sulfur and selenium in two amorphous forms one less transparent than the other comprising a mass of small particles of one form deposited in the interstices of the other.

3,612,936

APPARATUS CONTROLLING ACCUMULATED ELECTRON CHARGING OF A NONCONDUCTIVE MEDIUM

Robert S. Berglund, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jan. 2, 1970, Ser. No. 142
Int. Cl. G11b *7/04;* G11c *27/00;* H01j *29/74*
U.S. Cl. 313—68 5 Claims



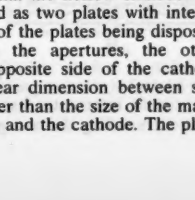
Apparatus comprising in combination a first electron generator including focusing and scanning means for deflecting a primary electron beam to produce a bombarded scan pattern on a nonconductive medium, and control means including a second electron generator for generating a second electron beam of low energy electrons directed along an electron axis that is nonintersecting with the medium. The control means also including deflecting means to afford electron flooding of the medium by the low energy electrons and thereby cause secondary emission of electron from the medium, collecting means for collecting the secondary emission electrons to afford control of the accumulated charge on the medium, and light shield and trapping means to prevent illumination of the medium by the second electron generator. In the first embodiment, the medium is photon emissive and the apparatus includes a photomultiplier. In the second embodiment, the medium is sensitive to the bombarding electrons for producing a pattern thereon.

3,612,937

LOW-PRESSURE CONTROLLED DISCHARGE DEVICE WITH TRIGGER ELECTRODE WITHIN HOLLOW CATHODE

Sergei Alexandrovich Smirnov, ulitsa Pavlika Morozova 1, kv. 15; Ivan Ivanovich Aksenov, prospekt Kurchatova 13, kv. 18, and Vladimir Konstantinovich Bocharov, proezd Evpatoriisky 1, kv. 18, all of Kharkov, U.S.S.R.

Filed Oct. 8, 1969, Ser. No. 864,579
Int. Cl. H01j *17/00*
U.S. Cl. 313—197 3 Claims



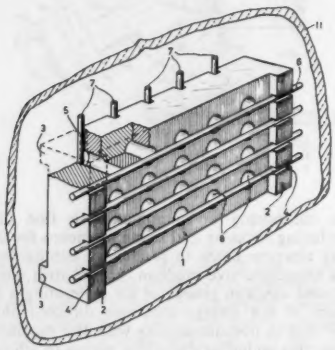
A discharge device comprises an anode, a hollow cathode with apertures on a side facing the anode and a trigger electrode disposed within the hollow cathode. The trigger electrode is constituted as two plates with interconnecting conductive posts one of the plates being disposed at the side of the cathode with the apertures, the other plate being disposed at the opposite side of the cathode. The hollow cathode has a linear dimension between sidewalls at least several times greater than the size of the main discharge gap between the anode and the cathode. The plate of the trigger

electrode which is disposed at the side of the cathode with the apertures may be placed in one of such apertures so as to lie in a common plane with the side of the cathode.

3,612,938
GAS DISCHARGE TUBE HAVING TWO SYSTEMS OF INTERSECTING ELECTRODES

Thijs Johannes De Boer; Johannes Hendricus Maria Johanns; Zeger Van Gelder, and Hendrikus Johan Lodewijk Trap, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 13, 1969, Ser. No. 824,175
Claims priority, application Netherlands, May 18, 1968, 6807093
Int. Cl. H01j *61/66*
U.S. Cl. 313—109.5 **1 Claim**



In a gas discharge tube having two intersecting systems of electrodes the anode wire is provided with a resistance layer. As a result of this more discharges can cooperate with one and the same anode. Therefore, it is possible to supply a pattern of discharges which nearly burn until an extinguishing signal is given. The memory is now built in the tube.

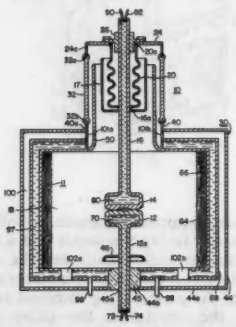
ERRATUM

For Class 313—105 see:
Patent No. 3,612,946

3,612,939
MOLECULAR SIEVE FOR VACUUM CIRCUIT INTERRUPTER

Mario Rabinowitz, Menlo Park, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 13, 1968, Ser. No. 712,790
Int. Cl. H01j *19/70*
U.S. Cl. 313—146 **9 Claims**

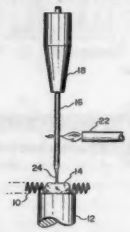


A vacuum-type circuit interrupter has a molecular-sieve shielding structure surrounding the arc gap to sorb vapors and gases during interruption and during the normal closed position of the interrupter.

3,612,940
LAMP FILAMENT STRUCTURE

Richard E. Sims, Des Plaines, Ill., assignor to Chicago Miniature Lamp Works, Chicago, Ill.

Filed July 20, 1970, Ser. No. 56,317
Int. Cl. H01j *1/88, 19/42*
U.S. Cl. 313—271 **4 Claims**

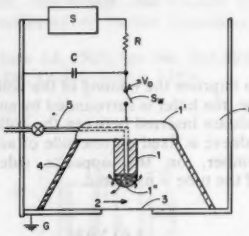


A lamp filament is reliably and firmly connected both electrically and mechanically to a lead wire or mounting post by a body of metallic material intimately entrapping the filament and metallurgically bonded to the lead wire.

3,612,941
PULSED FIELD EMISSION COLD CATHODE WITH MEANS FOR REPLACING STRIPPED ADSORBED GAS LAYER

Samuel V. Nablo, Lexington, and A. Stuart Denholm, Lincoln, both of Mass., assignors to Energy Sciences, Inc., Lexington, Mass.

Filed Apr. 24, 1970, Ser. No. 31,530
Int. Cl. H01j
U.S. Cl. 313—310 **8 Claims**



The present disclosure involves methods and apparatus for continually replacing the adsorbed gas layer stripped from high-current field-emission cold cathodes by the effects of high-voltage pulsing the cathode.

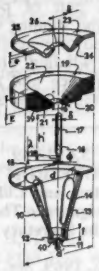
3,612,942
EMITTING ASSEMBLY OF AN ELECTRONIC BOMBARDMENT GUN

Jean-Pierre Peyrot, 8 domaine du Bel-Abord, Chilly-Mazarin, Essonne, France

Filed Nov. 28, 1969, Ser. No. 880,715
Claims priority, application France, Nov. 29, 1968, 176,086
Int. Cl. H01j *1/15*
U.S. Cl. 313—341 **13 Claims**

An electronic bombardment gun comprising the emitting assembly of a goffered washer, an insulating spacer, a central

electrode, a conical perforated filament, said filament being provided with a flange at its widest portion and with an

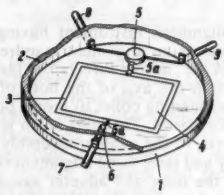


emitting annular end portion pierced with an orifice at its narrowest part.

3,612,943
TELEVISION CAMERA TUBE WITH BUILT-IN AMPLIFIER

Klaus Lehmann, Nieder-Ramstadt, and Rainer Bauer, Darmstadt, both of Germany, assignors to Fernseh GmbH, Darmstadt, Germany

Filed Sept. 15, 1969, Ser. No. 858,037
Claims priority, application Germany, Oct. 4, 1968, P 18 01 247.0
Int. Cl. H04n *5/26;* **H01j** *31/08, 23/16*
U.S. Cl. 315—3 **4 Claims**



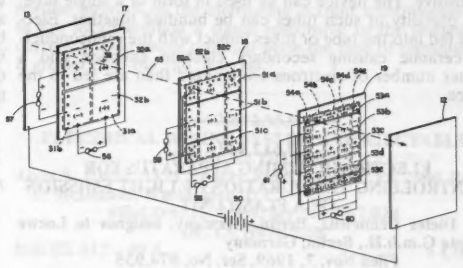
A television camera tube including semiconductor preamplifier means located adjacent to the target area and directly connected to the signal electrode around the target area. The usual ringlike contact is avoided, thereby reducing the input capacitance of the preamplifier and improving the signal-to-noise ratio.

3,612,944
ELECTRON BEAM SCANNER HAVING PLURAL CODED DYNODE ELECTRODES

Stanley C. Requa, Northridge, and Farrell A. McCann, Hawthrone, both of Calif., assignors to Northrop Corporation, Beverly Hills, Calif.

Filed June 30, 1969, Ser. No. 837,831
Int. Cl. H01j *29/41*
U.S. Cl. 315—12 **6 Claims**

An electron beam scanner includes a flat electron emitting cathode and a flat target plate, between which are sandwiched a plurality of dynode members for controlling an electron beam between these two members. This electron beam is controlled by means of a digital addressing signal fed to the dynode members in accordance with information to be displayed. Each flat dynode member has a first set of electrodes arranged on one broad surface thereof in accordance with a first predetermined coded finger pattern and a second set of electrodes arranged on the opposite broad surface thereof in accordance with a second predetermined finger pattern. The oppositely located electrode portions on each dynode are polarized in response to digital control signals to



address the electron beam to a single portion of the target plate at a time.

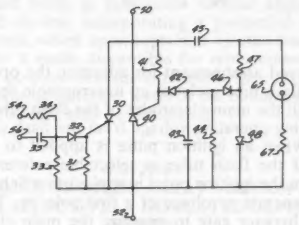
ERRATUM

For Class 315—13 C see:
Patent Nos. 3,613,108 and 3,613,109

3,612,945
DELAYED TURN-ON SOLID STATE RELAY

Carlile R. Stevens, 1000 Ironwood Place, Alamo, Calif.

Filed Nov. 2, 1967, Ser. No. 680,176
Int. Cl. H05b *37/00*
U.S. Cl. 315—200 **10 Claims**

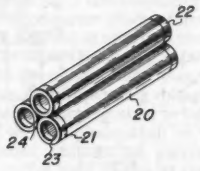


A solid state relay is described which exhibits gradual turn-on characteristics. This relay is useful, for example, for turning ON and OFF traffic control signal lights, wherein the gradual turn-on characteristics of the relay significantly reduce the current surge normally associated with the turn-on of incandescent lamps.

3,612,946
ELECTRON MULTIPLIER DEVICE USING SEMICONDUCTOR CERAMIC

Minoru Toyoda, Takatsuki-shi, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto-fu, Japan

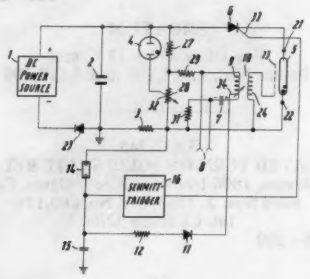
Filed Aug. 1, 1968, Ser. No. 749,387
Claims priority, application Japan, Aug. 1, 1967, Mar. 29, 1968, 42/49459;43/20599
Int. Cl. H01j *43/00*
U.S. Cl. 313—105 **10 Claims**



An electron multiplier device. A solid body of barium titanate semiconducting ceramic is formed into a tube or plu-

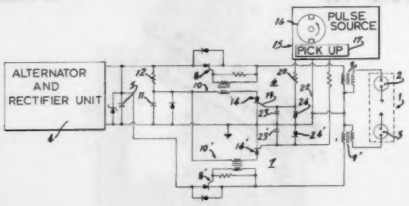
rality of tubes and at least two electrodes are positioned at spaced points on the tube. The ceramic has a resistance-temperature characteristic which is other than negative, i.e. zero or positive. The device can be used in form of a single tube, or a plurality of such tubes can be bundled together. Electrons fed into the tube or tubes impact with the semiconducting ceramic causing secondary electron emission and a greater number of electrons are emitted than are fed to the device.

3,612,947
ELECTRONIC TIMING APPARATUS FOR CONTROLLING THE DURATION OF LIGHT EMISSION OF A FLASH UNIT
Rolf Dieter Dennewitz, Berlin, Germany, assignor to Loewe Opta G.m.b.H., Berlin, Germany
Filed Nov. 7, 1969, Ser. No. 874,935
Claims priority, application Germany, Jan. 28, 1969, P 19005 223.4
Int. Cl. H05b *41/32*
U.S. Cl. 315—151 **7 Claims**



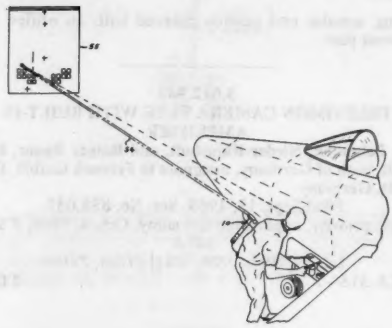
An improved arrangement for adjusting the operating duration of a flash tube includes an interruptable thyristor gate in series with the main electrodes of the flash tube for selectively coupling operating voltage from the flash capacitor to the tube. When an ignition pulse is applied to the trigger electrode of the flash tube, a selectable reference voltage derived from the ignition pulse is applied to a Schmitt trigger circuit to generate a voltage of a first polarity. This voltage opens the thyristor gate to energize the main electrodes of the flash tube, thereby causing the tube to emit a flash of light. A portion of the corresponding light reflected from an object illuminated by the flash tube is detected by a photosensitive element and integrated to form a control signal. The control signal is applied to the input of the Schmitt trigger for a duration sufficient to overcome the reference input voltage and thereby reverse the polarity of the output voltage. This latter voltage disables the thyristor gate and terminates the flash.

3,612,948
ELECTRICAL PULSE TRIGGERED SYSTEMS
Floyd M. Minks, Kissimmee, Fla., assignor to Brunswick Corporation
Continuation-in-part of application Ser. No. 772,127, Oct. 31, 1968. This application Oct. 9, 1969, Ser. No. 865,050
Int. Cl. H05b *37/02*
U.S. Cl. 315—209 R **23 Claims**



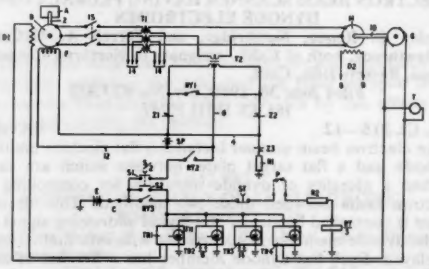
This disclosure relates to a capacitor discharge ignition system for an internal combustion engine employing alternately fired controlled rectifiers for discharging of a capacitor to the engine sparkplugs. The opposite ends of a single winding are connected respectively to the gates of the controlled rectifiers. A pair of permanent magnets are sequentially coupled to the winding with successive magnets being oppositely polarized to generate time-spaced alternating current signals in the winding. The signals are alternately of opposite polarity sequence and automatically apply the proper polarity signal to the gates in alternate sequence.

3,612,949
LASER BORESIGHT DEVICE
Ardath M. Becraft, Dayton, and Clifford E. Hammer, Trotwood, both of Ohio, assignors to The United States of America as represented by the Secretary of the United States Air Force
Filed Sept. 26, 1969, Ser. No. 861,386
Int. Cl. G01b *11/26*
U.S. Cl. 356—153 **2 Claims**



A boresight alignment instrument having a helium-neon gas laser mounted on an alignment mandrel which fits into the gun barrel. A 45° mirror directs the laser beam along a line concentric with the axis of the bore of the barrel. The mandrel has an expanding collet to insure positive locking of the mandrel in the barrel. The laser beam is aligned with the desired output axis, of the adapter assembly, by securing the adapter assembly and laser to an alignment fixture which permits rotation of the laser and adapter assembly. The mirror position is adjusted to stop all motion of the light spot when the assembly is rotated 360°. The device is used with a highly reflective target to make the device useful under all lighting conditions.

3,612,950
MOTOR CONTROL SYSTEM
Thomas A. Knott, 136 Lambton Road, Wimbledon, London S W 20, England
Filed Sept. 17, 1969, Ser. No. 858,823
Claims priority, application Great Britain, Sept. 18, 1968, 44301/68
Int. Cl. H01j *9/38*
U.S. Cl. 317—13 B **11 Claims**



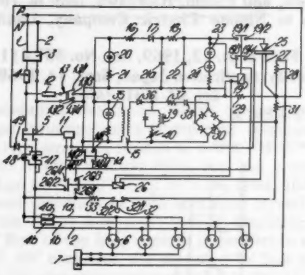
Disclosed is a motor control system for energizing a motor which in turn drives a pump for pumping liquefied gases. A

3-Φ alternator (alt.) supplies current to the motor. The alternator field winding is supplied with a first current by a low voltage circuit and with a second current by a current sensing circuit connected to sense the load current passing from the alternator to the motor and to generate a current which is a function of the load current. A single cutout relay having a first pair of contacts connected in the low-voltage circuit and a second pair of contacts connected in the current sensing circuit operates to disconnect both the low-voltage circuit and the current sensing circuit from the alternator field winding, and, thereby stop the motor and pump, whenever any one of several monitored parameters exceeds a chosen threshold value.

3,612,951
SAFETY DEVICE FOR USE WITH ELECTRIC INSTALLATIONS

Leo Wajl, Tel Aviv, Israel, assignor to Samuel Cohen Johananoff, Monte Carlo, Monaco

Filed Mar. 17, 1969, Ser. No. 807,656
Claims priority, application Israel, Mar. 26, 1968, 29,699
Int. Cl. H02h *1/02*
U.S. Cl. 317—18 D **5 Claims**

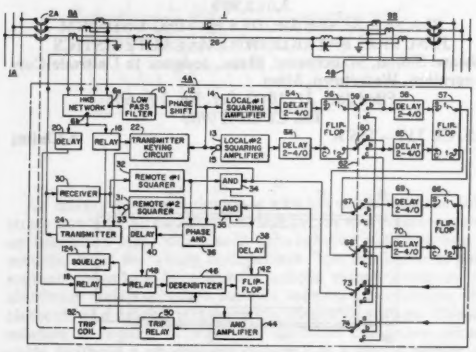


A safety device for use with an electric installation wherein an automatic circuit breaker is provided associated with a silicon controlled rectifier whose gate electrode is connected to one or more metallic parts of outer casings of applicances to be fed by the installation such that when a potential of predetermined magnitude appears on these metallic parts the silicon controlled rectifier conducts and results in the immediate opening of the circuit breaker.

3,612,952
TIME DELAY SIGNAL DEVICE ESPECIALLY FOR PHASE COMPARISON PROTECTIVE RELAYING SYSTEM

John E. Hagberg, Mountain Lakes, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 30, 1970, Ser. No. 51,097
Int. Cl. H02h *3/28, 7/26*
U.S. Cl. 317—27 R **4 Claims**

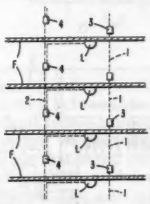


A phase comparison relaying network which permits the delaying of the local signal which responds to the alternating current at the local terminal of the alternating current transmission line for an interval which may be greater than the time interval of 180° of the alternating current whereby to compensate for time delay in the transmission from the remote terminal of the alternating current transmission line to the local terminal a signal responsive to the alternating current at the remote terminal when the time of transmission is greater than the 180° interval.

3,612,953
ELECTRICAL WIRING SYSTEM AND EJECTABLE DEVICES THEREIN

Alvin S. Gittin, 11717 Larry Road, Fairfax, Va., and Ralph E. McDonald, Washington, D.C.

Filed Oct. 16, 1969, Ser. No. 867,024
Int. Cl. H02h *5/04*
U.S. Cl. 317—40 A **6 Claims**

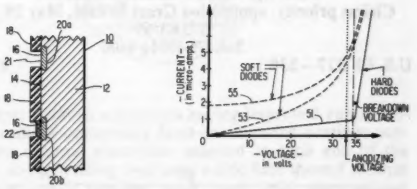


An electrical wiring system for multistory buildings, embodying feed-wires extending vertically through the several stories of the buildings with electrical devices, such as outlet receptacles, switches, etc., in housings connected in circuit with said feed wires in substantial vertical alignment, and each of said devices incorporating a protective safety-fuse element therein, which upon rupture is ejected from its housing to render it easily discernible for replacement. Thereby the need for conventional panel boards with circuit-breakers or fuses therein, at different levels of the buildings, and in individual apartments, may be eliminated.

3,612,954
SEMICONDUCTOR DIODE ARRAY VIDICON TARGET HAVING SELECTIVELY INSULATED DEFECTIVE DIODES

Robert Steven Silver, Kendall Park, N.J., and John Jaklik, Jr., Bristol, Pa., assignors to RCA Corporation

Filed Nov. 12, 1969, Ser. No. 876,013
Int. Cl. H01l *17/00, 15/00*
U.S. Cl. 317—235 R **3 Claims**



The target comprises a semiconductor substrate wafer and an array of semiconductor diodes formed in a wafer with contact surfaces exposed at a surface thereof. At least one "soft" diode of the diodes passes a greater current when backbiased at a given operating voltage than other "hard" diodes of the diodes pass at the operating voltage. An electrically insulating layer, selectively deposited to be thicker on the contact surfaces of the soft diodes than on the contact surfaces of the hard diodes, reduces the current through the soft diodes relative to the hard diodes at the operating voltage. The target may be prepared by the method which comprises the steps of:

Covering all of the wafer but for the contact surfaces with a masking layer;

contacting the contact surfaces of the wafer with an oxidizing electrolyte solution, and

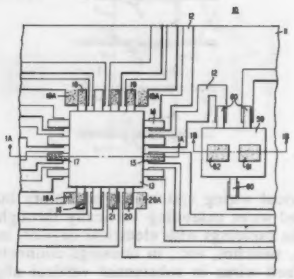
applying an anodizing voltage across the wafer and the solution and permitting electrical current to pass through the diode array and the solution, whereby a thicker insulating layer selectively forms anodically on the contact surfaces of the soft diodes.

3,612,955

CIRCUIT BOARD CONTAINING MAGNETIC MEANS FOR POSITIONING DEVICES

Alexander D. Butherus, Murray Hill; Miles C. Huffstutler, Jr., Watchung, and Jack A. Morton, South Branch, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 21, 1969, Ser. No. 792,487
Int. Cl. H01h 3/14
U.S. Cl. 317—101 A **1 Claim**



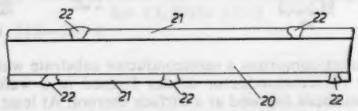
Ferromagnetic materials are incorporated into circuit boards in accordance with predetermined patterns to enable by magnetic attraction substantially automatic positioning on the boards of semiconductor devices containing ferromagnetic material distributed therein in configurations to match the material in the circuit boards.

3,612,956

COMPOSITE DIELECTRIC ELECTROLYTIC CAPACITOR

Henley Frank Sterling, Hudsoh, Ware; John Henry Alexander, Bishop's Stortford, and Denis William John Hazelden, Bishop's Stortford, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 30, 1970, Ser. No. 33,408
Claims priority, application Great Britain, May 29, 1969, 27163/69
Int. Cl. H01g 9/00
U.S. Cl. 317—230 **10 Claims**



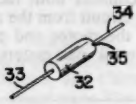
An electrolytic capacitor structure and a method for making such a capacitor wherein a composite dielectric is utilized so as to obtain the benefits of a high dielectric constant and the "self-healing" properties of an electrolytic capacitor. An aluminum anode is coated with a dielectric layer of titanium dioxide. The coated aluminum anode is then inserted into an electrolyte so as to anodize any portions of the aluminum remaining exposed after coating with the titanium dioxide due to defects in the coating.

3,612,957

MOLDED CAPACITOR AND METHOD

David J. Steigerwald, Greenville, S.C., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 15, 1970, Ser. No. 28,752
Int. Cl. H01g 9/00
U.S. Cl. 317—230 **10 Claims**



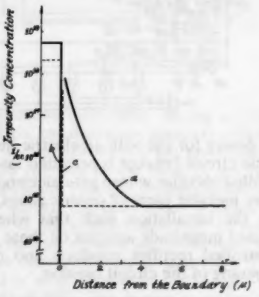
Molded solid electrolytic capacitors are produced from capacitor bodies having anode lead wires spaced apart from and electrically connected to the anode riser wire by an intervening deformably arranged connecting wire.

3,612,958

GALLIUM ARSENIDE SEMICONDUCTOR DEVICE

Takeshi Saito, and Fumio, Hasegawa, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Sept. 12, 1969, Ser. No. 857,411
Claims priority, application Japan, Sept. 14, 1968, 43/65915
Int. Cl. H01l 3/00
U.S. Cl. 317—234 R **2 Claims**



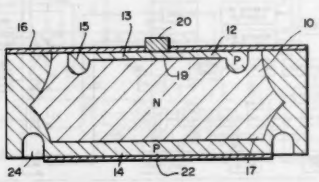
A gallium arsenide semiconductor device comprises a low resistivity substrate having a high impurity concentration. A first high impurity concentration layer is grown on the substrate and a second, low impurity layer is grown on the first grown layer. The introduction of impurities from the substrate into the grown semiconductor layer is significantly decreased.

3,612,959

PLANAR ZENER DIODES HAVING UNIFORM JUNCTION BREAKDOWN CHARACTERISTICS

Edward Simon, Manchester, Mass., assignor to Unitrode Corporation, Watertown, Mass.

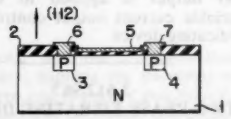
Filed Jan. 31, 1969, Ser. No. 795,605
Int. Cl. H01l 9/00
U.S. Cl. 317—235 R **4 Claims**



A high-voltage planar Zener diode in which enhanced switching performance is provided by a unique junction con-

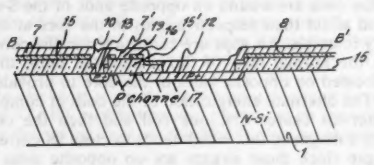
figuration. The junction is configured to provide low-series resistance and uniform conduction across a controlled region of the junction thereby to achieve uniform and sharp voltage breakdown characteristics.

3,612,960
SEMICONDUCTOR DEVICE
Yoshiyuki Takeishi, Tokyo; Tai Sato, Yokohama-shi; Hisashi Hara, Kamakura-shi; Yoshihiko Okamoto, Yokohama-shi, and Hajime Maeda, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Oct. 14, 1969, Ser. No. 866,192
Claims priority, application Japan, Oct. 15, 1968, Dec. 3, 1968, Dec. 18, 1968, 43/74653;43/88214;43/92354
Int. Cl. H01l *11/14*
U.S. Cl. 317—235 5 Claims



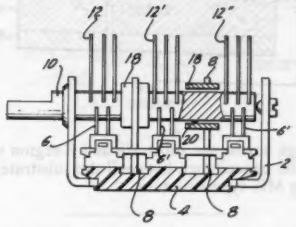
A semiconductor device in which a semiconductor of diamond-type structure or a compound semiconductor of zinc blende-type structure is used to utilize the flow of a hole current in an intense electric field, and has a construction such that when its crystal face is in [110] zone, and the angle θ of a normal direction of said specified crystal face with respect to the [110] axis is 0°–30°, 0° exclusive, then the direction of flow of the hole current is parallel to said [110]; if θ=40°–90°, 90° exclusive, the direction of flow of the hole current is in the direction perpendicular to the [110] axis; if said crystal face is in the [001] zone and said normal direction makes an angle θ=0°–45°, both 0° and 45° exclusive, with the [110] axis, the direction of flow of the hole current is in the direction perpendicular to said [001] axis.

3,612,961
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE
Keiichi Shimakura; Hirohiko Yamamoto, and Masamichi Shiraishi, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan
Filed July 7, 1969, Ser. No. 839,273
Claims priority, application Japan, July 6, 1968, 43-47302
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 R 3 Claims



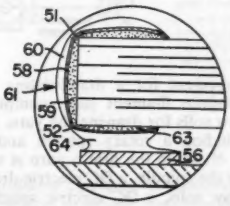
An integrated circuit device in which a semiconductor substrate contains a plurality of active or passive elements with an insulation layer interposed between the substrate and a metallic layer for wiring connections. The insulation at gate regions comprises phosphorous coated silicon oxide or an aluminum oxide or other suitable materials to stabilize the elements at a desired relatively low threshold voltage. The insulation at regions between the elements comprises silicon oxide (without a phosphorus coating) or a silicon nitride or other suitable material which provides a relatively high threshold voltage and high surface density in order to prevent the formation of conducting channels between the elements.

3,612,962
VARIABLE CONDENSER
Yasuhiro Takeda, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan
Filed Aug. 21, 1970, Ser. No. 66,011
Claims priority, application Japan, Sept. 4, 1969, 44/69679
Int. Cl. H01g *5/06*
U.S. Cl. 317—254 14 Claims



In a variable condenser, and particularly one of the rotary type, electrical connection between the rotor and an external point such as the ground frame is accomplished in a a contactless manner by means of capacitance defined between the rotor and a fixed part mounted on the frame, that fixed part and the rotor being separated from one another so as to define a gap therebetween. The said connecting capacitance is connected in series with the variable capacitance defined between the rotor and stator and is sufficiently large relative to that variable capacitance so as not appreciably to affect the overall capacitance of the unit. In its preferred form, the capacitance is defined between the rotor shaft and a cylindrical part which surrounds the rotor shaft, and the gap therebetween may be filled with a dielectric material which engages the shaft and serves as a bearing support therefor.

3,612,963
MULTILAYER CERAMIC CAPACITOR AND PROCESS
John Piper; Lawrence E. Nordquist, and Reinhardt C. Frederick Hanold, III, all of Greenville, S.C., assignors to Union Carbide Corporation, New York, N.Y.
Filed Mar. 11, 1970, Ser. No. 18,470
Int. Cl. H01g *1/00*
U.S. Cl. 317—261 5 Claims

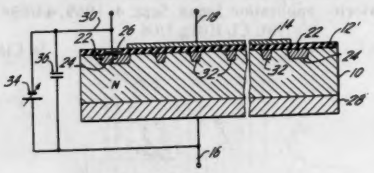


Multilayer ceramic capacitors having improved end metallization coatings comprising fired-on silver-frit coatings contacting the internal electrodes exposed at each end of the capacitor and extending over onto a side face thereof to form two spaced-apart bonding pads, and thin electroplated copper coatings conformally covering the silver coatings.

3,612,964
MIS-TYPE VARIABLE CAPACITANCE SEMICONDUCTOR DEVICE
Satoru Kawazu, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 2, 1970, Ser. No. 213
Claims priority, application Japan, Jan. 6, 1969, May 9, 1969, 44/1249;44/35611
Int. Cl. H01l *11/14*
U.S. Cl. 317—235 8 Claims

A comb-shaped P-type region is provided on one main face of an N-type substrate to form therebetween a P–N junction terminating at that face. An insulating film is disposed on

both the one face of the substrate and the P-region, except for a predetermined portion of the P-region, and a metallic layer is disposed on the film to extend over the P–N junction.



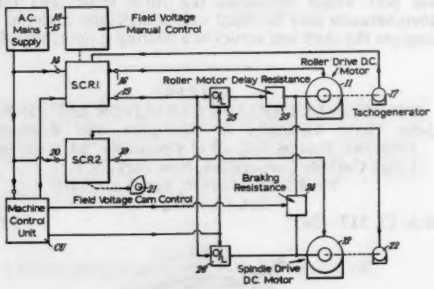
A DC voltage across the substrate and P-region is controlled to change the capacitance between the substrate and film of the resulting MIS-type structure.

3,612,965

DRIVING ARRANGEMENT FOR A TEXTILE DRAWTWISTING MACHINE

Joseph France, Harwood, nr. Bolton, England, assignor to T.M.M. (Research) Limited, Hartford Works, Oldham, Lancashire, England

Filed Jan. 14, 1969, Ser. No. 791,017
Claims priority, application Great Britain, Jan. 17, 1968, 2541/68
Int. Cl. H02p *5/46*
U.S. Cl. 318—7 **13 Claims**



A driving arrangement for a drawtwisting machine for drawtwisting continuous filament yarn, comprising a draw zone including draw rolls for drawing the yarn, a takeup and twisting zone including a rotary spindle and a ring and traveler by means of which the drawn yarn is wound onto a package carried by the spindle, a DC electric draw roll motor for driving the draw rolls, a DC electric spindle motor for driving the spindle, common armature voltage control means to control the armature voltages applied to the motors to provide for a variation of the armature voltages from values giving rise to crawl speeds for the two motors for starting up purposes to values giving rise to normal running speeds for the two motors, and yield voltage control means to control the field voltages to be applied to the motors and including automatic means for adjusting the field voltage of the spindle motor thereby to control the speed thereof independently of the speed of the draw roll motor.

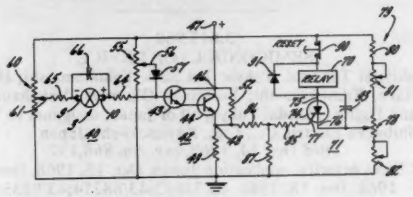
3,612,966

PIEZOELECTRIC TRANSDUCER WITH IMPROVED SENSING CIRCUIT

Frank R. Dybel, 512 Mackinaw, Calumet City, Ill.

Filed Nov. 3, 1969, Ser. No. 873,207
Int. Cl. H01h *47/00, 47/32*
U.S. Cl. 317—123 **13 Claims**

An improved sensing circuit particularly adapted for use with a piezoelectric transducer or the like, which transducer is characterized by its extremely high internal impedance. The transducer is disposed in a normally balanced input circuit so that there is effectively zero current flowing through the transducer when it is not activated. A unity-voltage-gain, high-current-gain amplifier is biased to its linear conduction



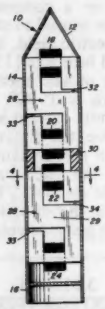
operating point so as to present an extremely high dynamic input impedance to the output signal from the transducer. The amplifier output is applied to trigger a variable threshold, variable current output control circuit having a relay as an indicating device.

3,612,967

TWO-PHASE VIBRATING DEVICE

Marlin D. Lee, 5416 East Lee, Tucson, Ariz.

Filed Aug. 31, 1970, Ser. No. 68,211
Int. Cl. H02k *33/00*
U.S. Cl. 318—123 **7 Claims**



A high-frequency vibrator for pushing pipe underground and plowing in underground cable is disclosed. An alternating electromagnetic field is established in a generally S-shaped magnetic core by connecting each of two opposing coils of the vibrator to a corresponding phase of a two phase AC electrical system, whereby one coil experiences zero current while the other coil generates a maximum magnetic field. The coils are wound on opposite ends of the S-shaped core and affect their respective ends of the core at complementary intervals. Air gaps are constructed in the core to interrupt the normal flow of flux within the core, the gaps being located on opposite sides of the core to provide the S shape. The alternate energization of the coils at complementary intervals causes first one coil and then the other to produce a magnetic flux which tends to close its corresponding airgap since these airgaps are on opposite sides of the core, first one side, then the other side of the core tends to shorten, creating a side-to-side bending motion.

3,612,968

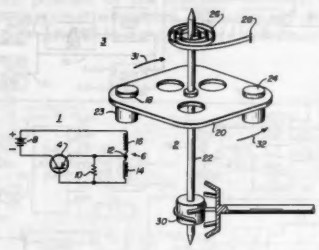
SIMPLIFIED ELECTROMECHANICAL OSCILLATOR

Frank H. Marz, Delavan, Wis., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

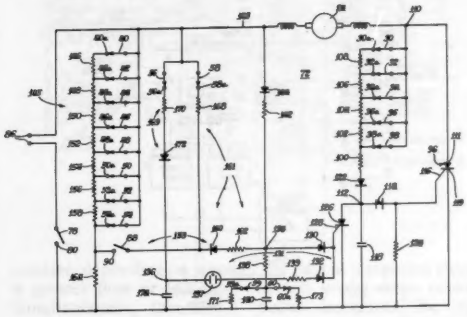
Continuation-in-part of application Ser. No. 831,046, June 6, 1969, now abandoned. This application Mar. 11, 1970, Ser. No. 18,678
Int. Cl. H02k *33/00*
U.S. Cl. 318—128 **6 Claims**

Permanent magnet mounted on an oscillatory arm controlled by a hairspring swings past a stationary coil having op-

positely wound sensing and driving portions. Voltage induced in the sense coil by movement of the magnet triggers a transistor; pulses of current caused thereby to flow in the collector-emitter circuit of the transistor pass through the driving portion of the coil. With the coil connections shown the action is regenerative, running the transistor to saturation. The field of the drive coil imparts a mechanical force to the magnet, and maintains it in oscillatory movement.



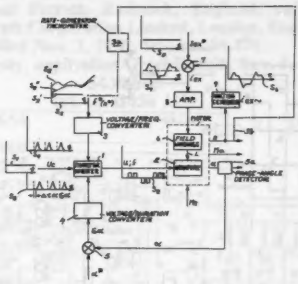
3,612,969
AUTOMATIC BLENDER
James B. Cockroft, Wauwatosa, Wis., assignor to John Oster Manufacturing Co., Milwaukee, Wis.
Filed June 30, 1969, Ser. No. 837,759
Int. Cl. H02p 7/18
U.S. Cl. 318—163 **15 Claims**



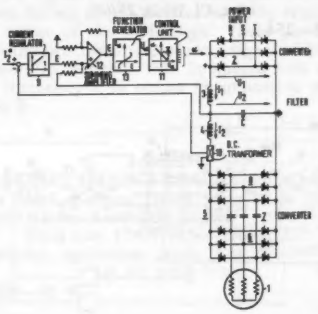
An automatic blender than can be programmed to perform a variety of tasks with perforated recipe cards is provided. The card bearing the desired recipe is inserted between a printed circuit control board and an assembly of spring brushes so that the perforations allow only selected brushes to make electrical contact with the printed circuit board. The blender START pushbutton and power switch are also actuated by the recipe card, so the blender has no external controls.

3,612,970
AUTOMATIC-CONTROL SYSTEM FOR THE ANGULAR SPEED OF A SYNCHRONOUS MOTOR
Eugen Ladislay Sofan, Bucharest, Romania, assignor to Ministerul Industriei Constructiilor de Masini, Bucuresti, Romania
Continuation-in-part of application Ser. No. 704,941, Feb. 12, 1968, now abandoned. This application Aug. 31, 1970, Ser. No. 68,155
Int. Cl. H02p 5/28
U.S. Cl. 318—175 **10 Claims**

A synchronous motor is driven from a forced-commutation thyratron-type inverter whose control inputs are provided by a voltage/frequency converter and a voltage/duration converter responsive to the motor speed and phase relationships for establishing the ignition and cutoff of the power pulses.



3,612,971
STATIC CONVERTER WITH DC INTERMEDIATE CIRCUIT FOR CONTROLLING THE SPEED OF A THREE PHASE MOTOR
Felix Blaschke, and Herbert Ripperger, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Aug. 27, 1969, Ser. No. 853,356
Claims priority, application Switzerland, Sept. 2, 1968, 13151/68
Int. Cl. H02d 5/40
U.S. Cl. 318—227 **4 Claims**

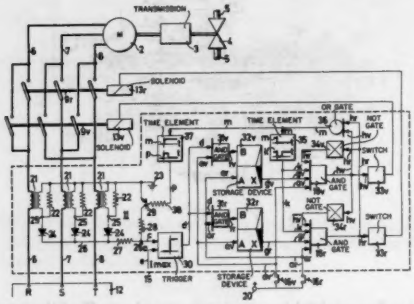


A first controllable converter is connected to an electrical power supply source. A second controllable converter is connected to a three-phase electric motor having stator windings impressed by preenergizing current. At least one smoothing choke for controlling the speed of the motor is connected at one end to the first converter and at the other end to the second converter. A control circuit causes the voltage at the one end of the choke to follow the voltage at the other end of the choke.

3,612,972
ADJUSTING DRIVE
Ferdinand Konig, Seuzach, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthyr, Switzerland
Filed Jan. 28, 1970, Ser. No. 6,524
Claims priority, application Switzerland, Feb. 6, 1969, 1815/69
Int. Cl. H02p 1/40
U.S. Cl. 318—227 **3 Claims**

The adjusting drive is controlled in dependence on the excess current of the motor and acts on either of the switching means in the conductor lines between the motor and current source to switch off the motor. A blocking arrangement is

also used so as to prevent further movement of the motor after a shutdown which arrangement becomes unblocked upon reversing of the motor.



3,612,973

A BRUSHLESS DC MOTOR SYSTEM COMBINED WITH A THYRISTOR BRIDGE INVERTER

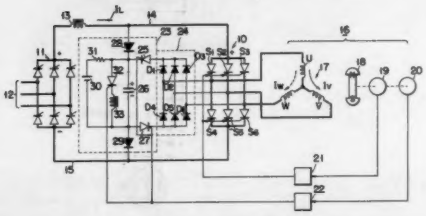
Masateru Kuniyoshi, Yokohama-shi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 16, 1969, Ser. No. 885,636

Claims priority, application Japan, Dec. 20, 1968, Feb. 24, 1969, 43-93114;44-13166

Int. Cl. H02k *29/00*

U.S. Cl. 318—254 **7 Claims**



A polyphase thyristor bridge inverter wherein, to energize the polyphase armature winding of an electric motor, the thyristor bridge is subjected to either natural or forced commutation, the latter being effected more reliably than the former, the thyristor is safely operated under a rated load or a heavier load required, for example, in starting the motor, and the forced commutation is preferably used for such heavier load to eliminate the wasteful motion of the inverter.

3,612,974

DIGITAL MOTOR SPEED CONTROL

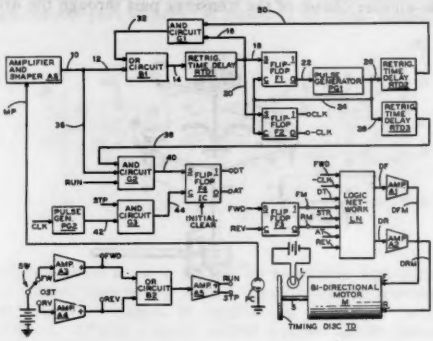
Edgar Wolf, New Hyde Park, and Edward Henry Lau, Old Westbury, all of N.Y., assignors to Digitronics Corporation, Nassau County, N.Y.

Filed May 21, 1969, Ser. No. 826,383

Int. Cl. H02p *5/06*

U.S. Cl. 318—314 **9 Claims**

A motor generates first pulses having a frequency related to the speed of rotation of the motor. Second pulses having durations at least greater than a minimum time duration are generated in response to the first pulses. Third pulses having durations related to the time differences between the terminations of the second pulses and the initiations of the first pulses are generated and used to pulse drive the motor.



3,612,975

ELECTRONIC DATA-PROCESSING APPARATUS

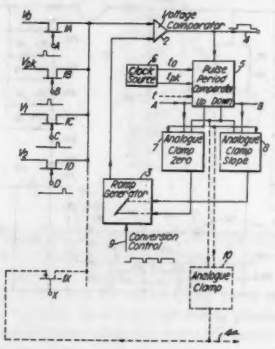
Arthur T. Keefe, Little Bookham, England, assignor to Ian Young (Electronic Designs) Limited, London, England

Filed Aug. 5, 1969, Ser. No. 847,654

Claims priority, application Great Britain, Aug. 7, 1968, 37634/68

Int. Cl. G05b *11/28*

U.S. Cl. 318—599 **10 Claims**



In a circuit for converting a signal representing by its amplitude an item of data into a signal representing the item of data by its pulse duration, or vice versa, by comparison of an input signal with a ramp signal, a calibrating signal is applied to the amplitude-to-duration converter and the resulting pulse duration is compared with a calibrating pulse having a duration corresponding, at the required conversion scale, to the amplitude of the calibrating signal; any error signal from the comparator is used to adjust the ramp slope or ramp base line in a sense such as to reduce the error.

3,612,976

POSITION CONTROL SYSTEM

Robert W. Tripp, Tuckahoe, N.Y., assignor to Inductosyn Corporation, Carson City, Nev.

Continuation-in-part of application Ser. No. 729,018, May 14, 1968, now abandoned. This application Apr. 9, 1969, Ser. No. 814,670

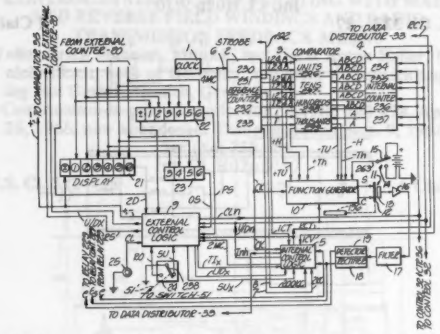
Int. Cl. G05b *19/18*

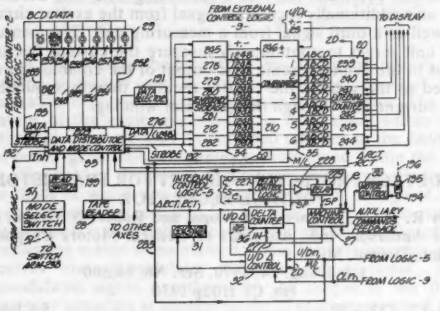
U.S. Cl. 318—603 **14 Claims**

A control system for positioning a machine member from an initial position to a new command position. The member

is moved by appropriate motor and control means in cooperation with a delta counter the contents of which continuously represent distance remaining to travel.

Initially, data representing the command position are read into temporary storage and compared with data, representing the initial position of the machine member, contained in another (external) counter. A series of pulses, herein designated ΔRCT, increment or decrement the other





counter, depending on whether the data in temporary storage is greater than or less than the data in the other counter. Simultaneously, the ΔRCT pulses increment the delta counter away from zero. When the contents of the other counter and temporary storage become equal, generation of the ΔRCT pulses is inhibited; the delta counter then contains how far the machine member must travel to get to the command position.

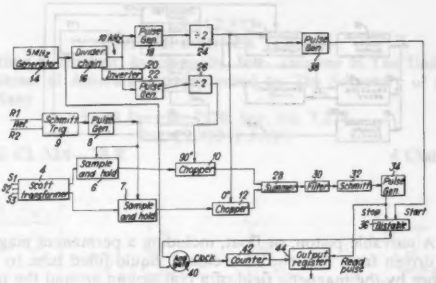
As the machine member moves toward the command position, a second series of pulses (herein designated RCT), each representing motion through an incremental distance, decrement the delta counter toward zero. As the delta counter contents decrease, indicating less distance to go, appropriate speed control signals are provided to slow down the motor. When the delta counter decrements to a predetermined value corresponding to a selected distance from the command position, the motor may be deenergized and the machine member coasts to a halt. Alternatively, when the delta counter reaches the predetermined value, a servosystem may be actuated which drives the member to the command position.

Should the member stop at other than the command position, the residual contents of the delta counter will represent the positioning error. The delta counter then is decremented to zero, and the contents of the other counter thereby correspondingly altered so as to represent the actual stop position. Additionally, the system includes storage of zero offset data. This feature has the advantage of resuming operation after an interruption, automatically, without extensive setting up operation or computation.

3,612,977
APPARATUS FOR SIGNALLING AN ANGULAR DISPLACEMENT OF A BODY ABOUT AN AXIS

Brian Raymond Perrett, Radstock, England, assignor to British Aircraft Corporation Limited, London, England

Filed Nov. 3, 1970, Ser. No. 86,476
Claims priority, application Great Britain, Nov. 5, 1969, 54304/69
Int. Cl. G05b *1/06*
U.S. Cl. 318—654 8 Claims

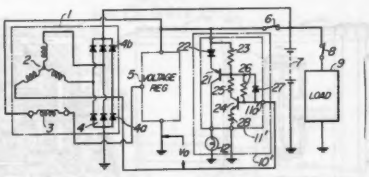


To provide an indication of the angular displacement Φ of the rotor of a synchro transmitter or resolver, two cyclically varying signals having amplitudes representing the sine and cosine respectively of the rotor shaft angle are derived and are used with two further cyclic signals, having a higher frequency *n* and in phase quadrature, to derive two trains of pulses at the higher frequency in phase quadrature, the two-pulse trains having amplitudes representing respectively the sine and cosine of the shaft angle. These pulse trains are combined and processed to provide a signal which is a function of $(\omega nt+\Phi)$, which is then compared with a reference signal at frequency *n* to obtain an indication of the rotor shaft angle Φ.

3,612,978
BATTERY CHARGE INDICATION MEANS

Kazumasa Mori, Kariya, Japan, assignor to Nippondenso Kabushiki Kaisha, Kariya-shi, Japan

Filed Aug. 12, 1970, Ser. No. 63,223
Claims priority, application Japan, Aug. 23, 1969, 41/66,599
Int. Cl. H02j *7/00*
U.S. Cl. 320—48 3 Claims

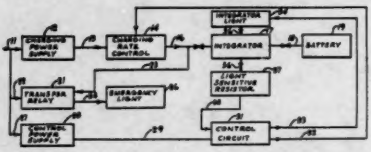


A battery charge indication means, whose input is the half-wave rectification of a single-phase voltage from an alternator of a battery charger, and in which the positive and negative portions of the single-phase half-wave-rectified voltage are alternately impressed on two transistors to maintain one of the transistors "off" during the charge of a battery, its circuit components including diodes and resistors as well as the aforementioned two transistors, so that it is free from a capacitive component, which would give rise to various problems.

3,612,979
SYSTEM FOR MEASURING TRANSFER OF ELECTRIC CHARGE

Wilfred Roth, Burlington, Vt., assignor to Dual-Lite Company, Newton, Conn.

Filed Dec. 10, 1968, Ser. No. 782,913
Int. Cl. H02j 7/04
U.S. Cl. 320—39 12 Claims

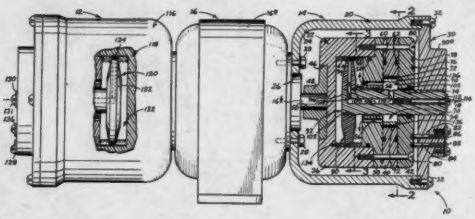


A movable piston, or float, including a permanent magnet is driven from one end of a closed, liquid-filled tube to the other by the magnetic field of a coil wound around the tube and energized by current flowing in one direction or the other according to the transfer of an electric charge into or out of a charge-accumulating or charge-producing element, such as a storage battery. A light bulb adjacent the tube directs light through the tube to a photocell. The transfer of a predetermined quantity of charge in one direction causes the piston to move to one end of the tube and interfere with passage of light through the tube. Transfer or charge in the opposite direction causes the piston to move out of the light path. The photocell may be used to control a circuit connected to maintain a charge on a storage battery by replenishing any dissipated charge at a relatively high rate and thereafter maintain the battery in a fully charged condition by a trickle charge. Establishment of the high charge rate in the system occurs when the piston has been moved out of the light path by transfer of charge away from the fully charged battery. The charge rate drops to a trickle charge value when the piston moves back to interrupt the light path, indicating that the battery is substantially fully charged.

3,612,980
LIQUID JET ELECTRICAL INVERTER

William L. King, Springfield, Oreg., assignor to Nathan E. Knecht, Springfield, Oreg.

Filed Aug. 21, 1970, Ser. No. 65,929
Int. Cl. H02m 7/90
U.S. Cl. 321—50 15 Claims

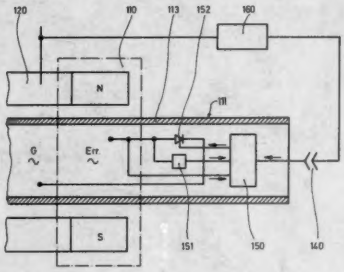


An electrical inverter employing for switching purposes a pair of stationary jets of electroconductive liquid which intermittently impinge pools of such liquid contained in recesses in a turning rotor. Different pools are connected electrically to the plus and minus terminals of a source of DC. Each jet is connected electrically to one of the two AC output terminals in the inverter.

3,612,981
CONTROL SYSTEM FOR GENERATOR HAVING RADIO TRANSMISSION FEEDBACK MEANS

Horst Anton Heller, and Walter Erich Mehnert, both of Munich, Germany, assignors to Entwicklungsring Sud GmbH, Munich, Germany

Filed July 9, 1969, Ser. No. 840,301
Claims priority, application Germany, July 19, 1968, P 17 63 697.4
Int. Cl. H02p 9/30
U.S. Cl. 322—27 1 Claim

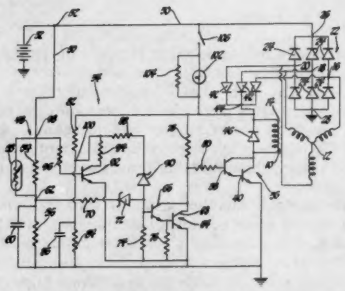


An electric generator system which includes a thyristor mounted within the generator rotor for controlling the field current, and a voltage regulator the output of which is coupled by means of a radio frequency transmitting unit to the generator rotor and fed into a combining unit. The combining unit additionally receives a signal from the exciter circuit as well as a third signal from a measuring unit. The measuring unit serves to continuously measure the current fluctuations in the exciter circuit. The output of the combining unit is fed to the gate of the control rectifier thereby regulating the current flow through the generator winding.

3,612,982
VOLTAGE PROTECTION CIRCUIT FOR TRANSISTOR VOLTAGE REGULATOR

Billy R. Jones; Richard L. Konopa, and Robert N. Green, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 24, 1970, Ser. No. 66,500
Int. Cl. H02p 9/30
U.S. Cl. 322—28 5 Claims



The voltage regulator of this invention is used to regulate the output voltage of an alternating-current generator connected with a bridge rectifier to supply the electrical loads on a motor vehicle and to charge the vehicle's battery. The generator's field winding is supplied with current by a plurality of auxiliary diodes through a transistor-switching device controlled by one of two voltage-sensing circuits. The first or primary voltage-sensing circuit provides control of the transistor-switching device during normal operation. However, if this first voltage-sensing circuit becomes disconnected or is otherwise incapable of providing control, the second voltage-sensing circuit provides the requisite control to regulate the alternating-current generator's output voltage. In this manner, the output voltage of the alternating-current generator is maintained substantially constant even if the first voltage-sensing circuit is disconnected. The regulator in-

cludes a second transistor switching device coupling the two voltage-sensing circuits and operative to enable or disable the second voltage-sensing circuit depending on whether or not the first voltage-sensing circuit is connected and providing a control signal.

3,612,983

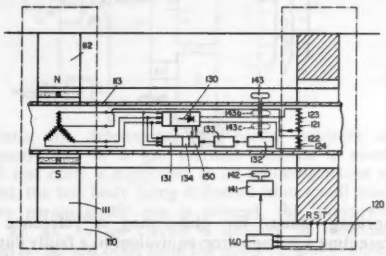
CONTROL SYSTEM FOR GENERATING WITH MAIN AND REVERSE FIELD WINDINGS AND RADIO TRANSMISSION FEEDBACK MEANS

Walter Erich Mehnert, Munich, and Horst Anton Heller, Munich-Allach, both of Germany, assignors to Entwicklungsring Sud GmbH, Munich, Germany

Continuation-in-part of application Ser. No. 724,478, Apr. 26, 1968, now abandoned. This application Sept. 9, 1968, Ser. No. 758,506

Int. Cl. H02p *9/30*

U.S. Cl. 322—28 **6 Claims**



The illustrated embodiments of this invention include an exciting generator and a power generator. Each of the generators is provided with a common tubular rotor. The armature of the exciting generator is maintained within the rotor and is fed through a controlled rectifier to the field of the power generator, which is also maintained within the rotor. The field of the power generator includes two windings, the fields of which are opposing. The output voltage of the power generator is sampled for modulation of a radio transmitter which in turn delivers power to a transmitting antenna. A receiving means is maintained within the tubular rotor and receives and demodulates the transmitted signal. The demodulated signal, together with the output of the field generator armature is applied to the control elements of the control rectifier and thereby determines the intensity of the power supplied to the power generator field windings and, correspondingly, the output of the power generator.

3,612,984

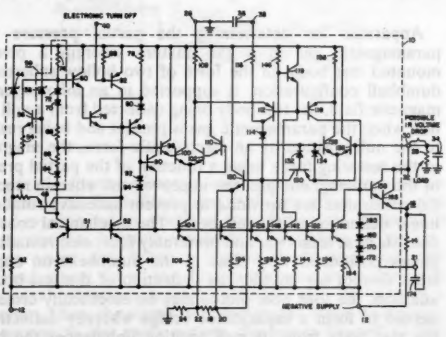
NEGATIVE VOLTAGE REGULATOR ADAPTED TO BE CONSTRUCTED AS AN INTEGRATED CIRCUIT

William F. Davis, Tempe, and Thomas M. Frederiksen, Scottsdale, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed May 8, 1970, Ser. No. 35,612

Int. Cl. G05f *1/58*

U.S. Cl. 323—9 **13 Claims**



A temperature-compensated, ripple-reducing negative voltage regulator which is adapted to be constructed as an integrated circuit in that no inductors and a minimum number of capacitors are used and any PNP transistors that are used need not have good current amplification factors. The regulator includes protection against excessive current and momentary excessive voltages.

ERRATUM

For Class 323 43.5 R see:
Patent No. 3,612,988

3,612,985

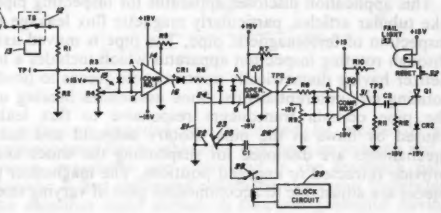
SWITCH BOUNCE TESTER

Arthur F. Rockett, Indianapolis, Ind., assignor to The United States of America as represented by The Secretary of the Navy

Filed Jan. 30, 1970, Ser. No. 7,277

Int. Cl. G01r *31/02*

U.S. Cl. 324—28 R **4 Claims**



A switch bounce tester to measure the cumulative bounce time having an input signal level comparator, an integrating operational amplifier, and an output voltage limit comparator with a clock-operated discharging switch in parallel with the operational amplifier to discharge same of signals from a tested switch for intervals of time of clock pulses and to sum the signals from the tested switch during intervals between clock pulses to produce voltage proportional to time of the bounce accumulation of the tested switch.

3,612,986

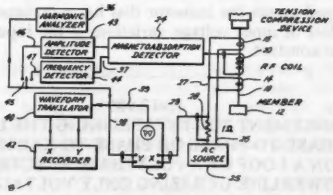
SENSING APPARATUS FOR USE WITH MAGNETOABSORPTION APPARATUS USING SEMICYLINDRICAL COILS

William L. Rollwitz, San Antonio; John P. Claassen, San Antonio, and John Arambula, Austin, all of Tex., assignors to Southwest Research Institute

Continuation of application Ser. No. 654,801, July 20, 1967, now abandoned. This application Mar. 16, 1970, Ser. No. 18,799

Int. Cl. G01r *33/12*

U.S. Cl. 324—34 R **3 Claims**



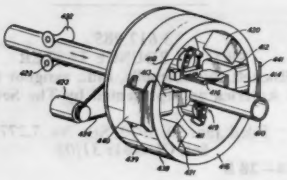
In magnetoabsorption apparatus, sensing apparatus having the preferred form of a radio frequency probe coil movable relative to a specimen having stress therein sensitive to stress magnitude and direction. The coil is connected to a sensing device. The coil includes a sufficient number of turns to form a signal of adequate strength to the magnetoabsorption apparatus to indicate the stress at various points on or about the specimen. The coil is connected through tuned circuits, transformer coupling circuits and other coupling circuits which improve the quality of operation by actually changing operation of the sensing device.

3,612,987

INSPECTION APPARATUS FOR MOVING ELONGATED ARTICLES INCLUDING MEANS FOR EXTENDING AND RETRACTING A SENSOR RELATIVE TO THE ARTICLE

Eugene A. Placke, and Claude D. Stegall, both of Houston, Tex., assignors to AMF Incorporated

Filed Apr. 13, 1970, Ser. No. 27,943
Int. Cl. G01r *33/12*
U.S. Cl. 324—37 **8 Claims**



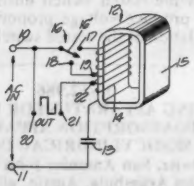
This application discloses apparatus for inspecting pipe or like tubular articles, particularly magnetic flux leakage type inspection of ferromagnetic pipe. The pipe is moved axially through rotating inspection apparatus which includes a magnetizer having diametrically opposed pole pieces to produce rotating circumferential flux. Shoe assemblies bearing upon the pipe contain transducers responsive to flux leakage caused by flaws in the pipe. Rotary solenoid and linkage mechanisms are disclosed for suspending the shoes and to provide retracted or engaged positions. The magnetizer pole pieces are adjustable to accommodate pipe of varying sizes.

3,612,988

FLUX-GATED VOLTAGE REGULATOR

Cravens L. Wanlass, 9871 Overhill Drive, Santa Ana, Calif.

Filed Sept. 15, 1969, Ser. No. 857,906
Int. Cl. G05f *1/14, 3/04*
U.S. Cl. 323—43.5 R **19 Claims**



A voltage regulator in which an inductor having a saturable core is connected in series with a capacitor, the output being taken from across the inductor. After startup, the combined effect of the input voltage and the capacitor cause the core of the inductor to periodically switch from a nonsaturated to a saturated condition and vice versa so that the impedance of the inductance switches correspondingly from a high to a low value. The result is a square wave voltage developed across the inductor that has a constant amplitude regardless of input voltage variations if the input frequency remains constant.

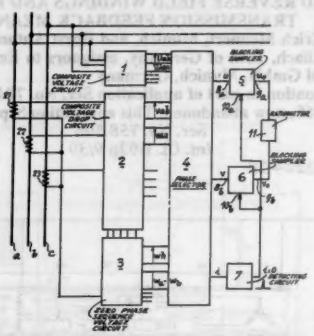
3,612,989

ARRANGEMENT FOR ESTABLISHING THE LOCATION OF PHASE-TO-PHASE OR PHASE-TO-EARTH FAULTS ON A LOOP OF A POLYPHASE ELECTRICAL POWERLINE UTILIZING ONLY VOLTAGE AND CURRENT MAGNITUDES AVAILABLE AT A MEASURING POINT ON THE LOOP

Michel Henry Pierre Souillard, Fontenay-aux-Roses, and Michel Louis Fonteny, Vert-le-Petit, both of France, assignors to Compagnie Des Compteurs, Paris, France

Filed Feb. 20, 1969, Ser. No. 801,058
Claims priority, application France, Feb. 27, 1968, 141,338
Int. Cl. G01r *31/08*
U.S. Cl. 324—52 **5 Claims**

A process for measuring the distance of a fault between phases and the earth of an electric power transport line where one effects, at the moment when the faulty current takes a zero value, the ratio between the voltage of the faulty loop at the measuring point and a reference voltage representing the voltage drop equivalent to a faulty current in a given length of the loop in question. A device for measuring the distance of a fault between phases or the earth



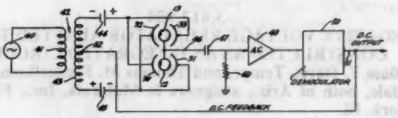
comprising means for elaborating a reference voltage representing a voltage drop equivalent to a faulty current in a given length of the faulty loop at the measuring point means for detecting the moment when the faulty current passes by a zero value, means for remembering the value at this moment of the voltage of said loop and the reference voltage, and means for effecting the ratio of these two voltages.

3,612,990

PARAMAGNETIC GAS SENSOR EMPLOYING AC POSITION SENSING AND ELECTROSTATIC DC NULL BALANCING

Anthony Del Duca, Santa Barbara, Calif., assignor to Beckman Instruments, Inc.

Filed Oct. 24, 1969, Ser. No. 869,235
Int. Cl. G01r *33/12, 29/22*
U.S. Cl. 324—36 **8 Claims**



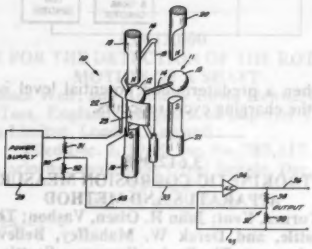
Apparatus for determining the partial pressure of a paramagnetic gas in a gas mixture wherein a pivotally mounted test body, in the form of two hollow spheres in a dumbbell configuration, is supported in an inhomogeneous magnetic field, the test body being deflected from a null position when the paramagnetic gas is present and being restored to the null position by an electrostatic force, the magnitude of the restoring force being a function of the partial pressure of the paramagnetic gas, the improvement wherein mechanical constraints are provided to prevent excessive rotation or linear deflection of the test body. The mechanical constraint consists of at least two, and preferably four, electrostatic pole pieces positioned very close to the dumbbells on opposite sides thereof for limiting the deflection of the test body. In addition, the four pole pieces may be electrically cross-connected to form a capacitance bridge whereby deflection of the test body from its null position unbalances the bridge providing an output signal which may be fed back to the pole pieces to restore the test body to the null position.

3,612,991

PARAMAGNETIC GAS SENSOR HAVING CAPACITIVE POSITION SENSING AND AC NULL BALANCING FEEDBACK

Malbone W. Greene, Covina, Calif., assignor to Beckman Instruments, Inc.

Filed Oct. 24, 1969, Ser. No. 869,237
Int. Cl. G01r *33/12, 17/06*
U.S. Cl. 324—36 13 Claims



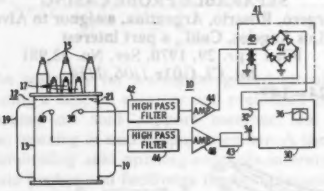
Apparatus for determining the partial pressure of a paramagnetic gas in a gas mixture wherein a pivotally mounted test body is supported in an inhomogeneous magnetic field, the test body being deflected from a null position when the paramagnetic gas is present, the improvement wherein an AC bridge circuit is utilized, in response to deflection of the test body from the null position, to generate an AC signal indicative of the partial pressure of the paramagnetic gas. The bridge circuit comprises a pair of electrostatic vanes which, in conjunction with the test body, form capacitive elements of the bridge circuit. The AC signal is either measured to determine the test body position, or demodulated to provide a DC signal. The DC signal may be fed back to the bridge circuit to return the test body to the null position for improved linearity and stability. Apparatus is further provided to vary the fraction of the DC signal fed back to the bridge circuit with changes in temperature of the test body to compensate the apparatus for temperature variations.

3,612,992

CORONA TESTING APPARATUS INCLUDING ENERGY STORAGE MEANS FOR INDICATING TIME DIFFERENCE BETWEEN CORONA SIGNALS

John C. Cronin, Horsham, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 30, 1969, Ser. No. 862,431
Int. Cl. G01r *31/08*
U.S. Cl. 324—52 2 Claims



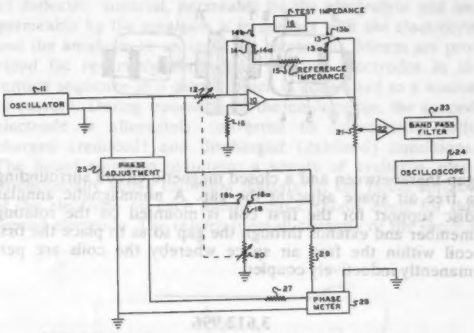
Apparatus for the detection and location of corona within the casing of fluid-filled electrical apparatus. First and second mechanical to electrical transducers are disposed to pickup corona initiated mechanical vibrations in the apparatus under test. When a corona discharge occurs, the electrical signal from the first transducer to receive the mechanical vibrations is used to initiate the charging of a capacitor. Then, the signal provided by the other transducer, in response to the same corona discharge, is used to terminate the charging of the capacitor. The magnitude of the charge or voltage across the capacitor is a direct indication of the difference between the distances separating each transducer from the source of the corona.

3,612,993

IMPEDANCE MEASURING APPARATUS

Harold A. Tims, Bartlesville, Okla., and Joe P. Lindsey, Stafford, Tex., assignors to Phillips Petroleum Company

Filed June 11, 1970, Ser. No. 45,505
Int. Cl. G01r *27/02*
U.S. Cl. 324—57 R 5 Claims



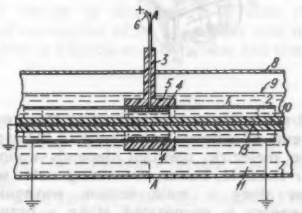
An unknown impedance is measured by means of an operational amplifier in which the unknown impedance and a reference impedance are connected in the feedback path selectively. A first calibrated resistance element is connected in the amplifier input circuit. A function generator having two outputs is connected to the amplifier and a second calibrated resistance element. The potential across the second resistance element is compared with the amplifier output.

3,612,994

CABLE INSULATION TESTER HAVING A LIQUID IMMERSED ANNULAR ELECTRODE

Lennard Hooper, Newport, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 19, 1969, Ser. No. 859,422
Claims priority, application Great Britain, Sept. 20, 1968, 44727/68
Int. Cl. G01r *31/12*
U.S. Cl. 324—54 6 Claims



Faults in cable insulation are detected by passing the cable through an annular electrode immersed in water. Relatively low voltage is applied between the electrode and the grounded core conductor of the cable. A fault in the insulation completes a discharge path through the water to ground to trigger an indicating circuit.

3,612,995

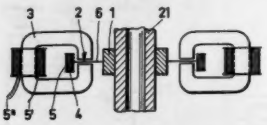
APPARATUS FOR ELECTRICALLY MEASURING A CONDITION OF A ROTATING MEMBER

Axel Leufgen, Muhlheim/Main, Germany, assignor to Dieness-Honeywell-Holding GmbH, Frankfurt am Main, Germany

Continuation of application Ser. No. 757,336, Sept. 4, 1968, now abandoned. This application May 4, 1970, Ser. No. 31,878
Int. Cl. G01r *27/00, 15/00*
U.S. Cl. 324—57 R 10 Claims

The condition, such as the temperature, of a rotating member is electrically measured in an apparatus which com-

prises a condition responsive impedance rotating with the member and a stationary measuring circuit. A first coil is mounted on the rotating member and is electrically connected to the impedance and a second coil is electrically connected to the circuit. A nonrotating magnetic core for the coils bears the second coil and provides two poles defining a



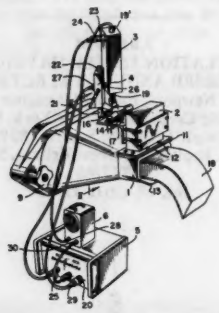
gap therebetween and a closed magnetic circuit surrounding a free air space adjacent the gap. A nonmagnetic annular disc support for the first coil is mounted on the rotating member and extends through the gap so as to place the first coil within the free air space whereby the coils are permanently inductively coupled.

3,612,996

INDICATING BY MICROWAVE ENERGY THE CONSTITUENT PROPORTIONS OF A FLOWING SUBSTANCE

William J. Bleackley, Ottawa, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Aug. 11, 1969, Ser. No. 848,874
Int. Cl. G01n *27/04*
U.S. Cl. 324—58.5 A **7 Claims**



A method and apparatus for indicating the proportions of the constituents of a flowing substance of the type wherein the effective dielectric constant depends upon the constituents, for example, butter, containing water wherein the butter flows along a main section waveguide, whilst microwave energy is propagated along a branch section waveguide through a window and into the main section waveguide. The whole waveguide configuration with the butter in the main section is a resonant microwave structure, and the ratio of the water in the butter is determined from the resonant frequency of the structure.

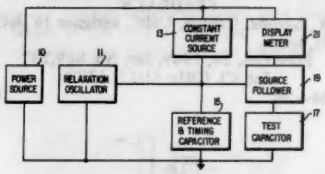
3,612,997

CAPACITOR APPARATUS INCLUDING A REFERENCE CAPACITOR FOR CONTROLLING THE CURRENT FLOW THROUGH A CAPACITANCE BEING MEASURED

John Paulkovich, 6001 Harland St., Lanham, Md.

Filed Feb. 18, 1970, Ser. No. 12,048
Int. Cl. G01r *27/26*
U.S. Cl. 324—60 C **16 Claims**

An apparatus for testing an item, such as a capacitor, to determine its capacitance value is described. A timing and reference capacitor is charged at a constant rate from a constant current source. The test capacitor charges at a related rate through a source follower transistor circuit which includes a current meter. The timing and reference, and the test capacitors are both discharged by a unijunction



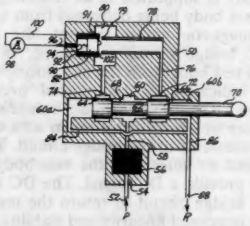
transistor when a predetermined potential level is reacheu. Thereafter, the charging cycle reoccurs.

3,612,998

ELECTROKINETIC CORROSION MEASURING APPARATUS AND METHOD

Bernus G. Turner, Kent; John H. Olsen, Vashon; Theodore R. Beck, Seattle, and Derek W. Mahaffey, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed June 1, 1970, Ser. No. 42,167
Int. Cl. G01r *27/00*
U.S. Cl. 324—71 C **7 Claims**



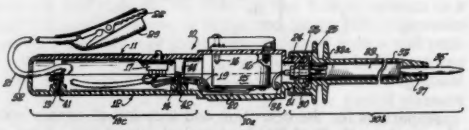
Hydraulic fluid having the characteristic of forming an electrical double layer in a hydraulic system and a resulting streaming current is subjected to a severe shear variation in the vicinity of an electrode surface in contact with the fluid whereby the charged species of the diffuse layer of the electrical double layer that are swept away by the shear variation are replaced by charged species flowing from the electrode into the fluid thereby inducing an electrical current in the electrode which is measured as a determination of the electrokinetic corrosion characteristics of the fluid.

3,612,999

VOLTAGE-MEASURING DEVICE HAVING INSULATED SEPARABLE PROBE CASING

Ramon Bergero, Rosario, Argentina, assignor to Alva M. Henderson, Los Angeles, Calif., a part interest

Filed Apr. 29, 1970, Ser. No. 32,981
Int. Cl. G01r *1/06, 1/14*
U.S. Cl. 324—149 **4 Claims**



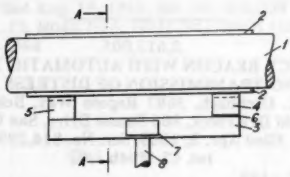
A hand-held apparatus for measuring high applied voltages in electrical circuits, having an elongate nonconductive casing longitudinally separable into two casing sections. A voltmeter is mounted to an enlarged intermediate portion of the casing, one tubular end portion providing a handle, an opposing tubular end portion being externally threaded for mounting of an insulating sheath enclosing an elongate resistor having one end extending into the casing and connected to one

terminal of the voltmeter and the other end connected to a test probe which projects from the insulating sheath. A ground wire is connected to the other meter terminal and projects from the handle end and terminated in a ground clip. A switch mounted in the handle portion enables short circuiting of the meter to damp the meter movement when not in use to protect it from physical shock. The two casing sections are held in assemblage by a transversely extending screw in the handle end portion an the insulating sheath threaded onto the other casing end portion.

3,613,000
DEVICE FOR THE DETECTION OF THE ROTATIONAL MOTION OF A SHAFT

Robert James Weir, and Anthony David Hewitt, both of Norton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 2, 1968, Ser. No. 780,517
Claims priority, application Great Britain, Dec. 7, 1967, 55766/67
Int. Cl. G01p *3/48*
U.S. Cl. 324—174 **1 Claim**

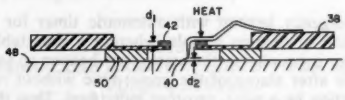


The rotational motion of a shaft having a magnetically detectable portion is detected using a device comprising a magnet, a magnetoresistor fixed relative to the magnet, and detection means to detect changes in the resistance of the magnetoresistor brought about by alterations in the field strength through the magnetoresistor as the shaft rotates.

3,613,001
PROBE ASSEMBLY

John L. Hostetter, Santa Ana, Calif., assignor to Collins Radio Company, Dallas, Tex.

Filed Dec. 5, 1969, Ser. No. 882,580
Int. Cl. G01r
U.S. Cl. 324—158 P **8 Claims**



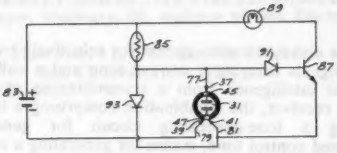
A probe assembly for testing integrated circuits and the like including a support member and preloaded probe members mounted on said support member and extending through an opening in said support member. A thermoplastic member encircling said opening supports intermediate portions of said probes and facilitates thermal planarizing of the probe contacts.

3,613,002
COULOMETER AND TIMING APPARATUS

George Trenkler, East Providence, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 17, 1969, Ser. No. 885,786
Int. Cl. G04f *9/00*
U.S. Cl. 324—182 **18 Claims**

A reversible coulometer includes a pair of electrodes wherein each electrode alternates between functioning as an anode and as a cathode on alternate cycles. The coulometer includes a container and a liquid alkaline electrolyte in the container. A first electrode is in contact with the electrolyte and comprises an inert support and a solid active cadmium-containing material. A second control electrode comprises a liquid cadmium amalgam containing not more than about 1 percent cadmium by weight, the second electrode having an electrochemical energy storing capacity corresponding to about 1 percent of the capacity of the first electrode. A layer of dielectric material, permeable by the electrolyte and impermeable by the amalgam is in contact with the electrolyte and the amalgam to separate the electrodes. Means are provided for reversibly connecting the two electrodes in alternate sequence in a circuit which is connected to a source of current. During operation of the coulometer, the second electrode is alternately converted to substantially fully charged (reduced) and discharged (oxidized) conditions. The liquid amalgam maintains a supply of available, electrochemically active cadmium material at the liquid surface of the electrode on each anodic and cathodic cycle for the second electrode. The relatively small capacity of the second

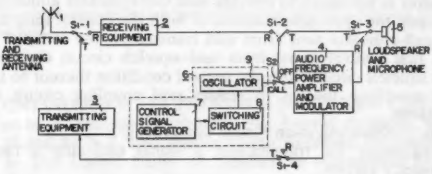


electrode relative to the first electrode then cooperates with the liquid surface characteristic of the second electrode so that the relative surface areas of the electrodes and the current density therebetween are maintained substantially constant from cycle to cycle. Also disclosed is electrical timing apparatus comprising the source of current, a resistor having a resistance which is a function of its temperature, and a current-integrating device, such as the coulometer. Means are connected to the coulometer for signalling when the second electrode has reached a preselected charge or discharge level. Means are provided for interconnecting the current source and the resistor in a circuit with the reversible coulometer. Shunt connected across the coulometer electrodes is a voltage limiter which limits the rise of voltage across the coulometer to a level below that at which hydrogen evolution will take place in the coulometer. The length of time for the signalling device to indicate the coulometer has reached a preselected charge or discharge level after reversing the sequence of connection of the electrodes with respect to the current source is a function of both time and temperature.

3,613,003
TRANSCEIVERS WITH CALLING DEVICES

Mutsuo Kubo, and Takeshi Kinoshita, both of Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed July 30, 1969, Ser. No. 846,170
Claims priority, application Japan, Aug. 5, 1968, 54914
Int. Cl. H04b *1/40*
U.S. Cl. 325—18 **10 Claims**

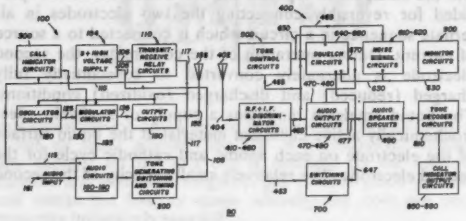


In a transceiver provided with a calling device, the circuit constant of an oscillator is varied by means of a switching circuit to generate a call signal of multiple frequencies and the switching circuit is controlled by a control circuit.

3,613,004
SEQUENTIAL TONE SELECTIVE CALLING COMMUNICATION SYSTEM AND COMPONENTS THEREOF

Keith H. Wycoff, P. O. Box 308, Lexington, Nebr.

Filed Mar. 9, 1964, Ser. No. 350,163
Int. Cl. H04q 7/02; H04b 5/04
U.S. Cl. 325—55 16 Claims



1. In a communication system for selectively transmitting carrier signals carrying a control tone and a call-indicator tone and intelligence from a transmitter to at least one selected receiver, the combination comprising a transmitter including a tone-generating circuit for generating a preselected control tone, means for generating a call-indicator tone, a modulating circuit for modulating the carrier signals in accordance with the control tone and the control-indicator tone and the intelligence to be transmitted, a transmitter output circuit coupled to said modulating circuit for transmitting the carrier signals including the control tone and the call-indicator tone and the intelligence to be transmitted, a receiver including an input circuit for receiving the signals from said transmitter, a detecting circuit coupled to said input circuit for detecting the control tone and the call-indicator tone and the intelligence in the signals, an audio circuit for converting the intelligence into sound waves, a coupling circuit coupling said detecting circuit to said audio circuit for coupling the intelligence and the control tone thereto, a squelch circuit coupled to said coupling circuit and operative in a first condition thereof to render said coupling circuit inoperative and operative in a second condition thereof to render said coupling circuit operative, a first control circuit coupled to said squelch circuit and responsive to the application of the carrier signals to said receiver for generating a first control signal, a second tone control circuit coupled to said squelch circuit and responsive to the application of the control tone to said receiver for generating a second control signal, and squelch circuit being responsive to the application thereto of said first and second control signals for actuating said squelch circuit from the first condition thereof into the second condition thereof to render said coupling circuit operative to pass the call-indicator tone therethrough, means for maintaining said squelch circuit in the second condition thereof until the removal of said first control signal therefrom, a third tone control circuit coupled to said coupling circuit and responsive to the application thereto of the call-indicator tone from said coupling circuit for producing an output from said third tone control circuit, and a call-indicator annunciator coupled to said third control circuit and actuated by the output therefrom, whereby said receiver is operative to operate said call-indicator annunciator upon the application thereto of both the control tone and the call-indicator tone from said transmitter, the removal of said first control signal from said squelch circuit changing said squelch circuit from the second condition thereof to the first condition thereof to render said coupling circuit inoperative.

16. A communication system comprising:

transmitter for transmitting a signal including a radio frequency carrier,

modulating means for modulating said carrier,

control means for initiating the operation of said modulation means for first causing said modulation means to modulate said carrier with a different frequency signal for a timer period of predetermined limited duration and for immediately thereafter causing said modulation means to modulate said carrier with a different frequency signal to thereby cause said transmitter means to first transmit said carrier modulated by a burst of said first frequency signal and then transmit said carrier modulated by a second frequency signal,

a receiver including means for receiving and demodulating the signal transmitted from said transmitter to provide an output including said burst of said first frequency signal followed by said second frequency signal,

a normally operative first decoding circuit means and a normally inoperative second decoding circuit means each connected to be supplied with said output and a utilization circuit means controlled by said second decoding circuit means,

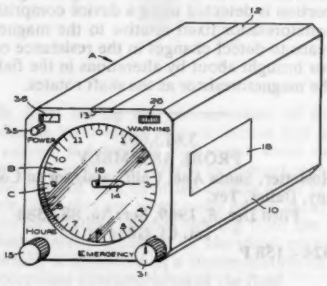
said first decoding circuit means having means responsive to said burst of said first frequency signal in the output from said receiver for rendering said second decoding circuit operative for a time period of predetermined limited duration overlapping the time during which said output includes said second frequency signal,

said second decoding circuit means having means responsive to said second frequency signal in the output of said receiver for causing energization of said utilization circuit means.

3,613,005
EMERGENCY BEACON WITH AUTOMATIC TIMER FOR STARTING TRANSMISSION OF DISTRESS SIGNALS

Friedrich K. Oschbach, 3603 Reposo Way, Belmont, Calif., and Donald D. Kroeck, 806 Sunset Drive, San Carlos, Calif.

Filed Apr. 8, 1969, Ser. No. 814,299
Int. Cl. H04b 1/02
U.S. Cl. 325—166 4 Claims



An emergency beacon with automatic timer for starting transmission of distress signals, wherein a presetable automatic timer is coupled to the emergency beacon so as to start the signals after elapse of the preset time without requiring further action by a pilot, or other individual. Thus the timer may be preset for a time greater than the anticipated time called for in a flight plan, and upon expiration of that time the distress signals will be automatically transmitted. A warning device is provided that will give a warning signal prior to elapse of the preset time, whereby the time that the beacon will start transmission may be delayed. Moreover, manually actuated means are provided that may be actuated in an emergency for starting transmission of the distress signals.

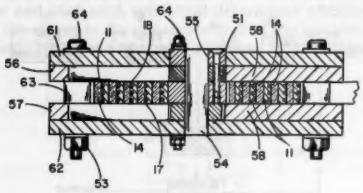
3,613,006
STABLE SUPERCONDUCTING MAGNET

Arthur R. Kantrowitz, Arlington, and Zdenek J. J. Stekly, Topsfield, both of Mass., assignors to Avco Corporation, Cincinnati, Ohio

Continuation-in-part of application Ser. No. 367,814, May 15, 1964, now abandoned. This application Nov. 23, 1966, Ser. No. 600,346
Int. Cl. H01f 7/22
U.S. Cl. 335—216 15 Claims

Superconductive coils formed from and a superconductive conductor comprised of superconductive material combined

with a substantial amount of normal metal in such a manner



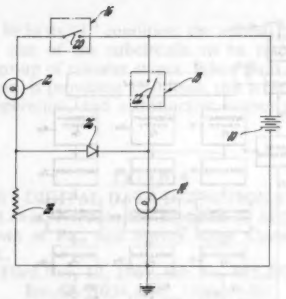
as to prevent propagation of normal regions in the superconductive material when exposed to a cryogenic environment.

3,613,007

TWO INTENSITY INDICATOR LAMP CONTROL SYSTEM

Thomas E. Endres, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1969, Ser. No. 850,538
Int. Cl. H04b *1/16;* **H01j** *7/42;* **H03j** *1/02*
U.S. Cl. 325—364 **4 Claims**



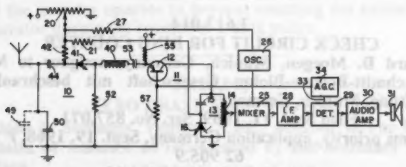
A first lamp is alternately illuminated at high and low intensities by variably regulating the bias of a rectifier so as to selectively energize the first lamp through either a second lamp or a resistor. As applied to a stereo radio receiver, the first lamp is a stereo reception indicator lamp and the second lamp is a tuning dial illumination lamp.

3,613,008

OVERLOAD COMPENSATION CIRCUIT FOR ANTENNA TUNING SYSTEM

Kamil Y. Jabbar, River Grove, Ill., assignor to Motorola Inc., Franklin Park, Ill.

Filed May 15, 1969, Ser. No. 824,864
Int. Cl. H04b *1/18*
U.S. Cl. 325—319 **3 Claims**



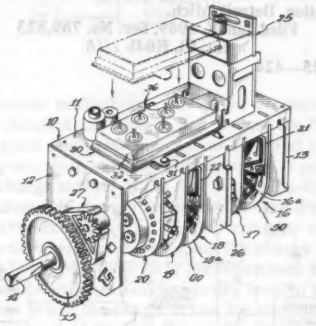
A radio receiver is supplied with signals from a high impedance capacitive antenna coupled in series with a low impedance resistive load in the form of the emitter-base circuit of a common-base RF transistor amplifier through a series-tuned circuit, including a varactor diode connected in series with an inductor. A source of DC biasing potential is provided to vary the biasing voltage on the diode in order to change its capacitance to tune the circuit over a predetermined band of frequencies. Overload compensation for the varactor diode is provided by utilizing the automatic gain control (AGC) voltage of the receiver, with the AGC voltage being applied to the base of the RF amplifier transistor to vary the biasing potential thereon. This in turn causes a corresponding variation in the impedance of the emitter-base path of the transistor with an increasing impedance being caused by increased signal levels. As a result, increasing amounts of the signal supplied by the antenna are dropped across the emitter-base path of the transistor at high signal levels, thereby limiting the RF signal level across the varactor diode to prevent rectification of high level signals thereby.

3,613,009

TUNER WITH SEPARABLE PASSIVE CIRCUIT ASSEMBLY AND ACTIVE CIRCUIT MODULE

Walter Meyer, McHenry, Ill., assignor to Oak Electro/Netics Corp.

Filed Mar. 11, 1969, Ser. No. 806,142
Int. Cl. H04b *1/08;* **H03j** *5/00*
U.S. Cl. 325—356 **4 Claims**



A VHF television tuner having a passive tuning circuit assembly and active circuits in a single, plug-in module. The tuning circuits are mounted on switch sections carried on a frame and provided with female clips which receive connector pins on the module. Circuits in the module are covered by a case and the connector pins mounted on the base of the module extend on one side thereof for connection with the female clips and on the other side through the case for connection with other circuits. The connector pins provide both electrical connection and mechanical stability for the circuit module.

3,613,010

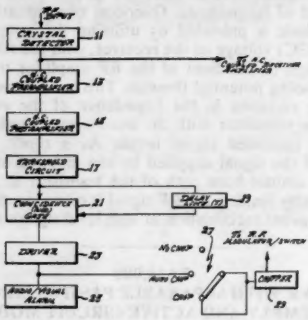
CONTINUOUS WAVE PRESENCE DETECTION CIRCUIT

Gerald A. Podolski, Levittown, Pa.; Harold Balshem, North Plainfield, N.J., and Stanley Victor, Lansdale, Pa., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Jan. 21, 1970, Ser. No. 7,956
Int. Cl. H04b *1/00*
U.S. Cl. 325—364 **2 Claims**

A continuous wave detection system having a crystal detector DC coupled to a threshold circuit. The output of the

threshold circuit is fed directly to a coincidence circuit and also via a delay of one frequency period. The driven gated



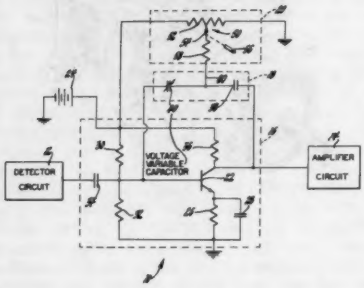
output from the coincidence circuit representing the continuous wave signal can be selected for chopping.

3,613,011

VARACTOR TONE CONTROL APPARATUS

Paul W. Wood, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 8, 1969, Ser. No. 789,823
Int. Cl. H04b *1/16*
U.S. Cl. 325—424 **1 Claim**



A remotely located potentiometer is manually adjustable so as to vary the capacitance of a varactor which defines a degenerative feedback for regulating the frequency response of an audio amplifier in a radio receiver thereby to exercise tone control over the audio output of the radio receiver. Preferably, the varactor has a metal-insulator-semiconductor structure including an insulating layer of tantalum oxide and a semiconductor layer of N-type silicon sandwiched between a pair of metal electrodes.

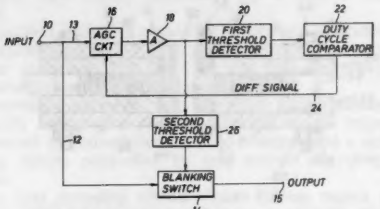
3,613,012

ADAPTIVE BLANKING APPARATUS

Claude H. Feistel, Austin, Tex., assignor to Tracor, Inc., Austin, Tex.

Filed Oct. 13, 1969, Ser. No. 865,652
Int. Cl. H04b *1/10*
U.S. Cl. 325—474 **6 Claims**

An adaptive blanking circuit includes a blanking switch operable by a threshold detector network, in turn controlled by an AGC network, the AGC network including a variable amplifier, a bipolar threshold detector and a duty cycle comparator for adjusting the incoming signal when it exceeds a



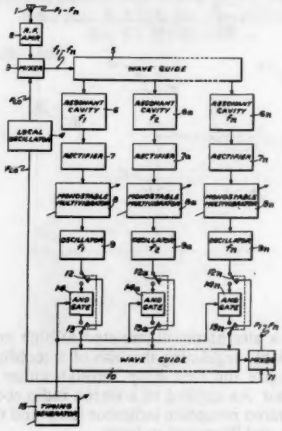
reference level for a predetermined percentage of time and for discriminating against high-impulse noise.

3,613,013

MEMORY SYSTEM

Lucio M. Vallese, Glen Ridge, N.J., assignor to International Telephone and Telegraph Corporation

Filed Dec. 7, 1966, Ser. No. 600,694
Int. Cl. G11c *13/00*
U.S. Cl. 328—34 **10 Claims**



A radiofrequency pulse memory system is described. There is provided a plurality of cavity resonators each resonant at a different frequency to detect a radiofrequency (RF) pulse having a frequency equal to the resonant frequency of the detecting resonator. A plurality of RF signals are locally generated each having a frequency equal to the frequency of the detected pulses. An arrangement responds to a detected pulse to provide at the system output an RF signal having a frequency equal to the frequency of the detected pulse for a variable period of time greater than the period of time of the detected pulse.

3,613,014

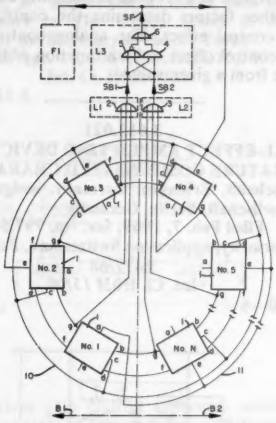
CHECK CIRCUIT FOR RING COUNTER

Gerhard D. Moegen, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed Sept. 11, 1969, Ser. No. 857,071
Claims priority, application Germany, Sept. 19, 1968, P 17 62 905.9
Int. Cl. H03k *21/30, 23/02*
U.S. Cl. 328—43 **6 Claims**

A check circuit for a ring counter of the electronic type. The check circuit continually monitors the ring counter and determines when an abnormal condition occurs, i.e., when

more than one stage of the counter is in a "1" condition and also when no stages of the counter are in the "1" condition. A separate subcircuit is provided for each half of the ring counter and each such subcircuit determines whether at least one of the stages in the respective half of the counter is in the "1" condition. Since one, and only one, of the stages should



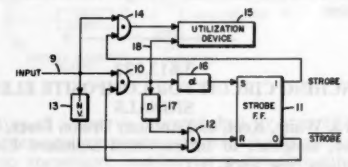
at any time be in its "1" condition, the normal condition then is for only one of the subcircuits to be responsive to its respective group of counter stages. When both of the subcircuits, or none, is providing an output, this is an indication of abnormal operation, and a distinctive output signal is provided.

3,613,015

BINARY DIGITAL DATA DETECTION SYSTEM

Harry W. Lewis, Norristown; Edmund J. McBride, Upper Darby, both of Pa., and Sperry Rand Corporation, New York, N.Y.

Filed Nov. 12, 1969, Ser. No. 875,887
Int. Cl. H03k *1/00, 5/00, 13/00*
U.S. Cl. 328—63 **4 Claims**



An improved strobe pulse generator system for self-clocking data systems wherein a resettable strobe pulse generator is prevented from resetting during a data pulse. The input data is applied to an AND gate the output of which is coupled to the strobe pulse generator to first set the strobe pulse and then after a delay to reset the strobe pulse generator. The reset coupling is through an inhibit gate which also receives the input data through an inverter. The inhibit gate and the inverter operate to prevent resetting the strobe pulse generator during the receipt of a data pulse.

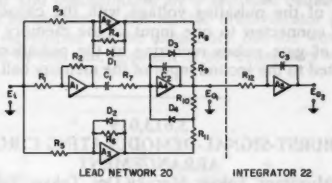
3,613,016

ZERO PHASE SHIFT FILTER

Sheldon L. Simmons, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 22, 1969, Ser. No. 868,372
Int. Cl. H04b *15/00*
U.S. Cl. 328—167 **4 Claims**

A zero phase shift filter effective over a wide frequency range. It is made up of a dynamically bounded differentiator, acting as a lead network, together with an integrator, the



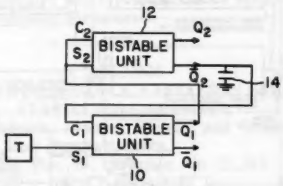
overall circuit having a total phase shift approaching 0° over a frequency band up to 10 octaves.

3,613,017

LOGIC CIRCUIT

Joseph A. Howells, Moorestown, N.J., assignor to Science Accessories Corporation, Southport, Conn.

Filed Apr. 28, 1969, Ser. No. 819,708
Int. Cl. H03k *3/10, 3/12, 17/30*
U.S. Cl. 328—207 **4 Claims**



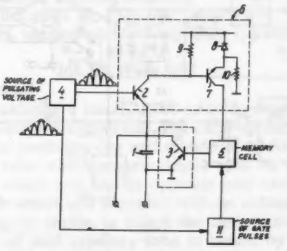
A monostable multivibrator circuit for producing a pulse of a fixed duration including a first D-type flip-flop having set, reset, clock and delay inputs, and a second D-type flip-flop having set, reset, clock and delay inputs. A trigger pulse triggers a change in state of the first D-type flip-flop, in turn causing a change in state in the second D-type flip-flop. The output of the second D-type flip-flop contains a capacitor storage circuit which serves to bypass the change in state of the second D-type flip-flop for a predetermined delay time, and feedback an exponentially increasing level to the first D-type flip-flop. When the charge across the capacitor reaches the threshold level of the first D-type flip-flop, the first flip-flop output again changes condition, causing the second output to change correspondingly.

3,613,018

A DEVICE FOR DETECTING THE ENVELOPE OF SINGLE-POLARITY PULSATING VOLTAGE

Valentin Mikhailovich Sitnichenko, ul. Odesskaya, 58/6, kv. 12, and Andrei Isakovich Kogut, ul. Pionerskaya, 20, kv. 12, both of Odessa, U.S.S.R.

Filed Sept. 9, 1969, Ser. No. 856,351
Int. Cl. H03d *1/18*
U.S. Cl. 329—101 **3 Claims**



A device for detecting the envelope of a single-polarity pulsating voltage comprising a fixed memory capacitor with a

charge circuit and a discharge circuit, a memory cell controlling the capacitor discharge circuit, a circuit for comparison of the pulsating voltage with the capacitor charge voltage connected to one input of the memory cell, and a source of gate pulses recurring at the pulsation frequency connected to the second input of the memory cell.

3,613,019

BURST-SIGNAL-DEMODULATING CIRCUIT ARRANGEMENT

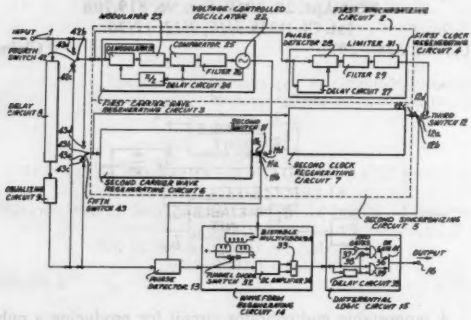
Takuo Muratani, Tokyo; Masaka Ogi, Tokyo; Takeshi Shoji, Yokohama, and Etsuji Kanamori, Ohno, all of Japan, assignors to Kokusai Denshin Denwa Do., Ltd., Tokyo, Japan and Fujitsu Limited, Kawasaki, Japan

Filed Apr. 1, 1970, Ser. No. 24,550

Claims priority, application Japan, Apr. 8, 1969, 44-27071

Int. Cl. H03k *9/00*

U.S. Cl. 329—104 **5 Claims**



A connector between a delay circuit and first and second synchronizing circuits supplies the output burst signal of the delay circuit instead of the input burst signal to one of the synchronizing circuits when such synchronizing circuit establishes synchronism. The input burst signals are supplied to the delay circuit and alternately to the first and second synchronizing circuits. The delay circuit has a delay time which is at least equal to the synchronizing time of the first synchronizing circuit, which in turn is equal to the synchronizing time of the second synchronizing circuit.

3,613,020

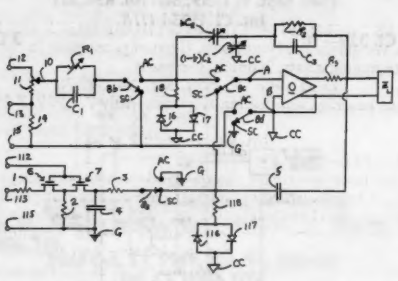
PROCESS CONTROL SYSTEM

Kevin P. McBride, Chili, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Oct. 28, 1968, Ser. No. 771,202

Int. Cl. H03f *1/00*

U.S. Cl. 330—1 A **11 Claims**



A sampling control system having a sampling capacitor the charge on which determines the control effect of a process control element. A MOSFET switch periodically connects the capacitor to a source of control voltage. When the MOSFET switch disconnects the capacitor from the control voltage the capacitor transfers its charge to an integrating holding circuit including an amplifier. The amplifier is part of an analog controller which can be connected to the control element to determine its control effect. The control element controls a variable in a process. In sampling control, this variable and other factors determine the control voltage, and hence the control effect. The analog controller, however, causes the control effect to be a function of the deviation of the variable from a given value.

3,613,021

HALL-EFFECT AMPLIFYING DEVICE WITH TEMPERATURE COMPENSATED CHARACTERISTIC

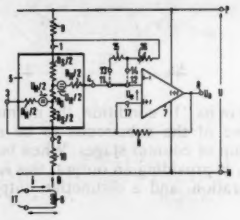
Christian Scheidt, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Feb. 7, 1969, Ser. No. 797,582

Claims priority, application Switzerland, Feb. 20, 1968, 2477/68

Int. Cl. H03f *15/00*

U.S. Cl. 330—6 **7 Claims**



A Hall-effect amplifying device comprising a Hall generator and an electronic amplifier is provided with a feedback resistor circuit which connects the amplifier output directly with one of the two Hall-voltage electrodes of the Hall generator. The amplifier in this device is an electronic direct-current amplifier of high-ohmic input resistance and high no-load gain. The resistance of the feedback connection is two or more orders of magnitude higher than the internal resistance between the Hall-voltage electrodes of the Hall generator.

3,613,022

BRANCHING CIRCUIT FOR COMPOSITE ELECTRICAL SIGNALS

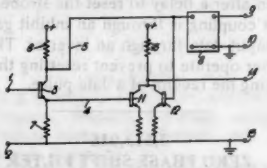
Lionel J. White, Kent, and Anthony Drake, Essex, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 3, 1969, Ser. No. 795,835

Claims priority, application Great Britain, Feb. 22, 1968, 8745/68

Int. Cl. H03f *3/68*

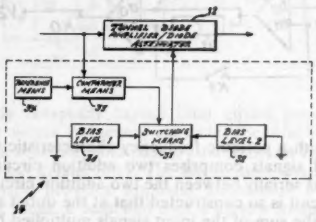
U.S. Cl. 330—30 R **4 Claims**



Branching networks comprise two filters having complementary characteristics e.g. a LP and a HP network. Only one filter network is used in the proposed arrangement. The complementary network is replaced by an active circuit using a unilateral phase splitter and a differential amplifier at the output of which only those signals appear which are blocked by the filter network. The main object of the invention is to

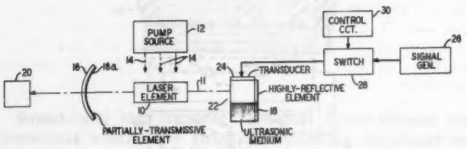
reduce the number of coils and capacitors required. These are expensive and are not suited to printed circuit technique.

3,613,023
STEP FUNCTION STC GAIN FUNCTION UTILIZING TUNNEL DIODE AMPLIFIER CIRCUITS
Carl R. Barrett, Jr., and Ernest R. Roehl, both of Anaheim, Calif., assignors to The United States of America as represented by the Secretary of the Air Force
Filed Apr. 16, 1969, Ser. No. 816,700
Int. Cl. H03f *21/00*
U.S. Cl. 330—61 A **2 Claims**



A radar receiver gain control apparatus utilizing tunnel diode amplifier circuits to provide a step-sensitivity time-control gain function to control the gain of the receiver.

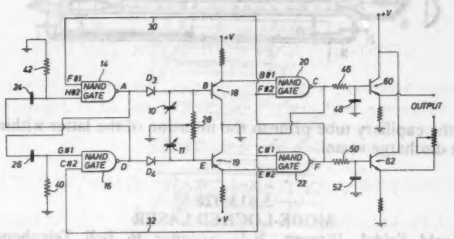
3,613,024
CONTINUOUSLY PUMPED Q-SWITCHED ARRANGEMENT INCLUDING AN N :YAIG LASER ELEMENT
Joseph E. Geusic, Berkeley Heights, and Michael A. Karr, III, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Mar. 7, 1969, Ser. No. 805,202
Int. Cl. H01s *3/11*
U.S. Cl. 331—94.5 **1 Claim**



Q-switching of a laser is accomplished by controlling the state of an intracavity acousto-optic switch that comprises a piezoelectric transducer bonded to a low-optical-loss ultrasonic propagation medium. Energization of the transducer causes a traveling acoustic diffraction grating to propagate through the medium. Illustratively, the direction of propagation of the grating is perpendicular to the direction in which light travels in the laser. The interaction between the light and the acoustic grating gives rise to diffraction losses that prevent the laser from oscillating. In response to a momentary deenergization of the transducer, the laser cavity is restored to a high-Q oscillatory condition during which energy stored in the system during the nonoscillatory state is suddenly released. During each such deenergization period, a high-amplitude output pulse of coherent radiation is obtained.

3,613,025
LOW PASS ASTABLE MULTIVIBRATOR
Wesley L. Joosten, Jr., El Paso, Tex., assignor to Globe Universal Sciences, Inc., Midland, Tex.
Filed Nov. 5, 1969, Ser. No. 874,279
Int. Cl. H03k *3/282, 3/286*
U.S. Cl. 331—47 **3 Claims**

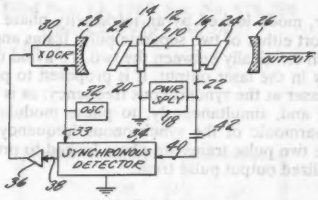
A free-running multivibrator circuit adapted to change oscillation frequency in response to the change in capacitance of at least one of a pair of capacitors which are not necessarily electrically isolated. The circuit comprises a free-running astable multivibrator of the common type which is controlled and synchronized by a set-reset bistable multivibrator. The outputs of the astable multivibrator provide the driving waveforms for the capacitors, but the waveforms are modified by the time constant of the capacitors which in



turn control the bistable multivibrator that synchronizes the astable multivibrator.

The low-pass astable multivibrator has application for measuring capacitance as in a microphone circuit having dual capacitor elements or any type of pressure sensor such as a rate-of-climb indicator for aircraft.

3,613,026
PLASMA TUBE IMPEDANCE VARIATION FREQUENCY STABILIZED GAS LASER
Michael L. Skolnick, Monroe, Conn., and United Aircraft Corporation, East Hartford, Conn.
Filed Mar. 20, 1970, Ser. No. 21,263
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **4 Claims**



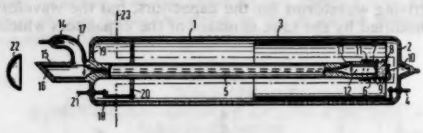
A gas laser employing a synchronous detector and modulated cavity length in a well-known hill-climbing servo frequency stabilization apparatus is improved by utilizing a voltage indicative of plasma tube impedance variations as the feedback input to the synchronous detector.

The invention herein described was made in the course of or under a contract or subcontract thereunder with The Department of the Air Force.

3,613,027
GAS LASER WITH COLD-CATHODE DISCHARGE
Heinz Westermeier, Neubiberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed June 29, 1970, Ser. No. 50,678
Claims priority, application Germany, July 7, 1969, P 19 34 414.0
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **6 Claims**

A gas laser utilizing a coaxial cold-cathode discharge tube having a large-surface cylindrical cold cathode disposed in a discharge vessel enclosing one end section of a relatively thin laser capillary tube which communicates with the interior of the discharge vessel and has its opposite end extending exteriorly of such vessel and provided with an enlargement for accommodating an anode, in which the closure member for the inner end of said capillary tube is closed by a closure member, preferably in the form of a platelike member provided with a reflecting surface on the inner face thereof with the closure member being secured to the adjacent end of the

capillary tube, preferably by spring means engaging both the tube and the closure member, which spring may be applied

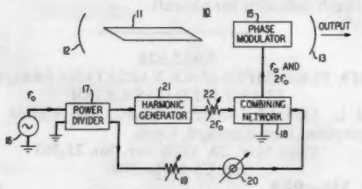


to the capillary tube prior to the insertion of the latter within the discharge vessel.

3,613,028
MODE-LOCKED LASER

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 21, 1969, Ser. No. 868,149
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 **5 Claims**

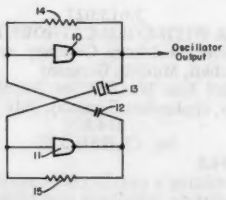


A laser, mode locked by an intracavity phase modulator, can support either of two separate pulse trains and, typically, will switch erratically between the two. To avoid the resulting instability in the laser output, it is proposed to phase modulate the laser at the synchronous frequency, as is done in the prior art and, simultaneously, to phase modulate it at the second harmonic of the synchronous frequency. So modulated, the two pulse trains are phase locked to produce a single, stabilized output pulse train.

3,613,029
CRYSTAL-CONTROLLED CROSS-COUPLED NAND GATE SQUARE-WAVE GENERATOR

Peter G. Bartlett, Davenport, Iowa, assignor to Struthers-Dunn, Inc., Pitman, N.J.

Filed June 8, 1970, Ser. No. 44,261
Int. Cl. H03b 5/36; H03k 3/282
U.S. Cl. 331—113 R **7 Claims**

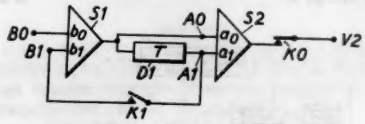


An integrated-circuit, crystal-controlled square wave pulse generator employing a pair of cross-coupled NAND gates. The output of one NAND gate is coupled to the other through a piezoelectric crystal, and the output of said other NAND gate is coupled to the input of said one NAND gate through a capacitor. Inverse feedback is provided for each NAND gate to maintain its operation in a linear portion of its operation.

3,613,030
FILTER WITH A PERIODIC TRANSFER CHARACTERISTIC

Tore Torstensson Fjallbrant, Goteborg, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Feb. 24, 1970, Ser. No. 13,600
Claims priority, application Sweden, Mar. 12, 1969, 3402/69
Int. Cl. H03h 7/04
U.S. Cl. 333—70 A **3 Claims**

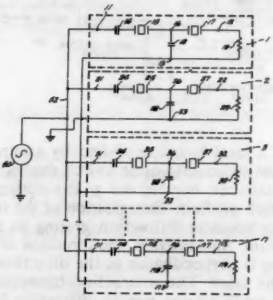


A filter with a periodic frequency characteristic for filtering sampled signals comprises two addition circuits and *p* delay circuits serially between the two addition circuits. Each addition circuit is so constructed that at the outlet side there is obtained the sum of the input signals multiplied by factors associated with the input terminals of the circuit. The delay of each of the delay circuits is equal to the sampling period T of the sampled signals. The outlets of the delay circuits are connectable, via contacts, to the inlet of the addition circuit at the inlet side of the filter. These contacts are closed during a number of K sampling periods and then open during *p* sampling periods.

3,613,031
CRYSTAL LADDER NETWORK HAVING IMPROVED PASSBAND ATTENUATION CHARACTERISTIC

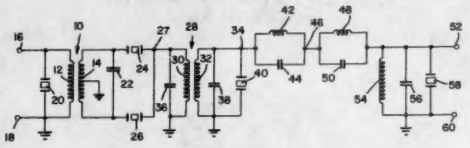
Charles W. Pond, Costa Mesa, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 15, 1969, Ser. No. 884,929
Int. Cl. H04j 1/02; H03h 9/32
U.S. Cl. 333—72 **4 Claims**



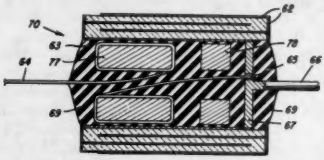
The disclosed contiguous crystal filter comb includes a plurality of crystal ladder networks connected to receive a common input signal and having respective frequency passbands covering substantially contiguous predetermined frequency ranges. Each ladder network includes a first capacitor and first and second crystal resonators connected in series between an input terminal and an output terminal. A second capacitor is connected between a reference terminal and a terminal intermediate the crystal resonators. The two crystal resonators in each network provide essentially the same equivalent series capacitance, essentially the same equivalent series inductance, and essentially the same equivalent parallel capacitance. The first capacitor provides a capacitance of at least five times the equivalent parallel capacitance and compensates for inherent slight differences in equivalent circuit values due to nonideal resonators.

3,613,032
COMPOSITE CRYSTAL FILTER CIRCUIT
Charles W. Pond, Costa Mesa, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Mar. 19, 1970, Ser. No. 20,950
Int. Cl. H03h 9/00
U.S. Cl. 333—72 4 Claims



A single composite crystal filter circuit provides an attenuation versus frequency characteristic which herebefore required a separate band-pass crystal filter, an LC filter, and a band reject crystal filter. The attenuation versus frequency characteristic provides stopband attenuation over a wide frequency range, a passband over a narrow frequency range, and high attenuation at one or more specific frequencies very near an edge of the passband.

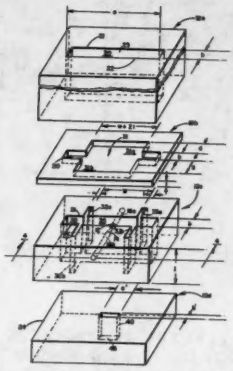
3,613,033
BROAD-BAND HIGH-FREQUENCY LOW-PASS FILTERS
Peter A. Denes, 9101 Crestwood NE, Alburquerque, N. Mex.
Filed May 20, 1968, Ser. No. 730,352
Int. Cl. H03h 7/14
U.S. Cl. 333—79 18 Claims



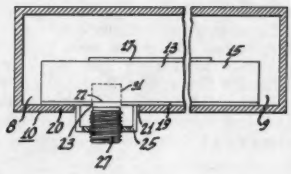
Broad-band high-frequency low-pass filters formed with capacitors which have structures including multilayer and ceramic types and monolayer capacitors. A passive element such as magnetic cores are contained wholly or partially within the capacitor structure. The filter units which may themselves form complete PI filters or L filters may also be combined as the inside portion of a tubular multilayer ceramic capacitor. Rolled capacitors may be used for distributed inductance and magnetic cores in combination with wound inductors or individually may be formed as portions of the filters.

3,613,034
WAVEGUIDE STRUCTURE WITH PSEUDOCAVITY REGION FOR CONSTRAINING PUMP AND IDLER ENERGIES
James N. Linnd, Costa Mesa, and William E. Meyer, Buena Park, both of Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.
Division of Ser. No. 617,231, Feb. 20, 1967, Pat. No. 3,501,706.
Filed Aug. 14, 1969, Ser. No. 870,903
Int. Cl. H01p 7/06
U.S. Cl. 333—83 R 8 Claims

A noel waveguide structure usable in a broadband microwave parametric amplifier is described which comprises a rectangular waveguide with a pair of substantially U-shaped channels extending oppositely from the top and bottom of the waveguide to a depth of ¼ guide wavelength at the lower idler frequency. The channels define a pseudocavity region in the waveguide, within which region the idler and pump energy is constrained and parametric interaction occurs. The waveguide is of sufficient width to allow propagation of a signal in the lowest order transverse electric mode and contains a varactor diode as a nonlinear reactance to couple pump energy at a high frequency to a signal at a much lower frequency.



3,613,035
TUNING ARRANGEMENT FOR A STRIP TRANSMISSION LINE IN A HERMETICALLY SEALED PACKAGE
Robert Emerson Askew, Berkeley Heights, N.J., assignor to RCA Corporation
Filed Nov. 13, 1969, Ser. No. 876,380
Int. Cl. H01p 1/00, 3/08
U.S. Cl. 333—84 M 6 Claims

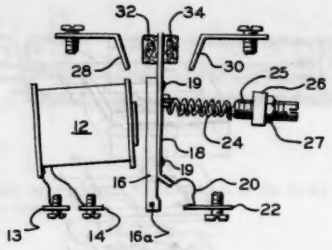


A tuning arrangement for a hermetically sealed strip transmission line is provided. A portion of the ground plane of the strip transmission line is removed leaving a portion of the dielectric substrate exposed. An enclosure surrounds the entire transmission line except for the area thereof where the ground plane is removed and the dielectric is exposed. A tuning stub is supported with respect to the removed area of the ground plane so as to enable tuning of the transmission line by the stub. Since the dielectric substrate remains between the inner area of the enclosure and the outside atmosphere, a seal can be maintained between the inner area of the enclosure and the outside atmosphere.

3,613,036
ELECTRICAL CONTACTS
John O. Kurtz, P.O. Box 79, Smithville Flats, N.Y.
Filed July 2, 1970, Ser. No. 51,932
Int. Cl. H01h 1/24
U.S. Cl. 335—196 2 Claims

An electromagnet relay carries a resilient conductive wire pad which is compressed when the pair of contacts mate to

minimize contact bounce and attendant mechanical shock,



and which provides contact wiping to provide reliable electrical contact.

3,613,037

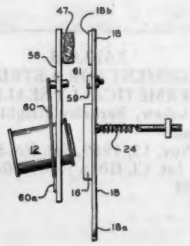
ELECTRICAL CONTACTS

John O. Kurtz, P.O. Box 79, Smithville Flats, N.Y.

Continuation-in-part of application Ser. No. 51,932, July 2, 1970. This application Aug. 27, 1970, Ser. No. 67,468

Int. Cl. H01h *1/24*

U.S. Cl. 335—196 **3 Claims**



In relays using conductive resilient contact pads formed of fine wire to decrease contact bounce and provide contact surface wiping, damage to the fine wires by contact arcing is obviated by provision of rigid auxiliary contact surfaces which open after the fine wire surfaces open in order to diver any arcing to the rigid auxiliary contact surfaces. Several spring-operated and several magnetically operated auxiliary contact arrangements are shown.

3,613,038

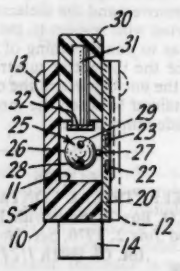
MINIATURE PUSHBUTTON DRY REED SWITCH

Richard E. Bell, Princeton, Ind., assignor to American Machine & Foundry Company

Filed Mar. 2, 1970, Ser. No. 15,668

Int. Cl. H01h *5/18*

U.S. Cl. 335—205 **10 Claims**



A precision-type snap switch embodying a reed-type switch providing sealed contacts, and a printed circuit board supporting the reed-type switch and conductively connecting selectively the sealed contacts to exposed switch terminals.

3,613,039

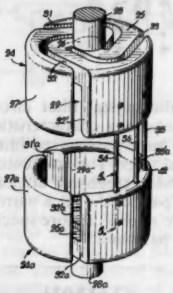
HIGH-VOLTAGE POWER VACUUM FUSE

Thomas E. Curtis; Charles A. Popeck, and Lloyd R. Beard, all of Centralia, Mo., assignors to A.B. Chance Company, Centralia, Mo.

Filed July 28, 1970, Ser. No. 58,922

Int. Cl. H01h *85/38*

U.S. Cl. 337—278 **23 Claims**



A power vacuum fuse for interrupting high-voltage alternating currents. The fuse has one or more fusible, current-responsive elements spanning a pair of spaced, cup-shaped electrodes located with the cavities thereof in facing relationship. The fusible elements extend between and electrically interconnect adjacent edge sections of the sidewalls of the electrodes. Leads to a high-voltage line extend from the central regions of the electrodes, with the base segment as well as the sidewall portions of each being provided with slot means therein extending from the central region to the periphery of the base segment and thence upwardly through the sidewall portion to define a current path to each element which extends both radially outwardly and tangentially with respect to a central axis of the electrodes. The effect of the slotted electrodes is to apply a force to each element which expels it from between the electrodes upon melting and disintegration of all elements, such force having a tangential component which spins the arc established when all the elements are severed. The cup-shaped configuration of the electrodes in conjunction with the slots therein prevents sufficient residue from the elements to be retained between the electrodes in an arc-conducting location and precludes the arc from dwelling at any one point which could cause extreme volatilization of the electrodes so that the circuit will be interrupted at the first natural current zero following severance of the elements.

3,613,040

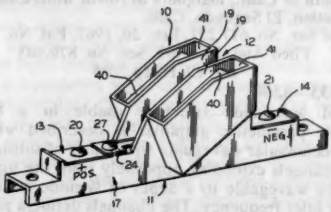
HIGH-VOLTAGE TEMPERATURE SWITCH

Chester H. Fluder, Wheeling, and Carl Krisco, Oak Park, both of Ill., assignors to Vapor Corporation, Chicago, Ill.

Filed Feb. 9, 1970, Ser. No. 9,633

Int. Cl. H01h *9/44, 85/38, 85/44*

U.S. Cl. 337—282 **5 Claims**



A high-voltage temperature switch for a direct current circuit including a body formed of insulating material and defin-

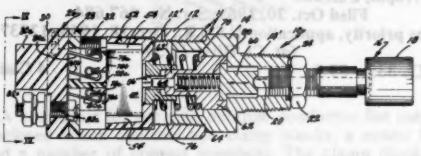
ing an arc chute within which a fusible conductor or link is positioned, wherein the link establishes a circuit and opens upon being subjected to a given temperature to interrupt the circuit, and means for generating a magnetic field across the arc chute about the fusible link to blow out the arc in the event the link opens.

3,613,041

THERMAL-RESPONSIVE SWITCH

Walter P. Graber, Cadillac, Mich., assignor to Kysor Industrial Corporation, Cadillac, Mich.

Filed Dec. 15, 1969, Ser. No. 885,026
Int. Cl. H01h *3/00, 9/02, 37/04*
U.S. Cl. 337—315 **11 Claims**



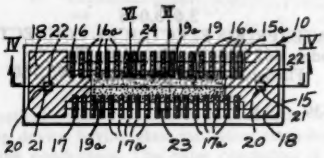
A thermal-responsive switch assembly of the type employing a temperature-responsive expansion means to shift electrical switch means. The switch means has terminal projections held in compressive engagement with cooperative terminal spring clips, such compression being by compressed biasing means that also functions as a return shifter for the temperature-responsive expansion means. The terminal spring clips are on the inner end of a special end cap removably secured to the switch assembly housing, such clips being separated by insulating fence means, and being electrically connected to external connector posts also separated by insulating fence means.

3,613,042

VARIABLE RESISTANCE ELEMENT WITH SPACED ROWS OF PARALLEL TABS

Herbert H. Leerkamp, Berne, and Daniel C. Kinsey, Decatur, both of Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed July 8, 1970, Ser. No. 53,226
Int. Cl. H01c *9/04*
U.S. Cl. 338—194 **11 Claims**



A resistance element for a variable resistance control having a plurality of spaced commutator bars disposed on opposite sides of a resistance film, each of the commutator bars in one row being in straddled relationship to the bars in the other row and at least the ends of the commutator bars being in overlapping relationship with a resistance film. A movable contactor mounted for movement along a predetermined path transversely of the commutator bars engages the commutator bars for altering the resistance of the variable resistance control.

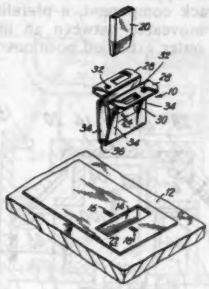
3,613,043

PRINTED CIRCUIT BOARD CONNECTOR

Wilfred Richard Scheller, New Cumberland, and Winfield Warren Loose, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 30, 1969, Ser. No. 820,427
Int. Cl. H01r *9/08;* **H05k** *1/00*
U.S. Cl. 339—17 C **9 Claims**

A female U-shaped electrical connector for staking to printed circuit boards capable of forming disconnect terminations between printed circuitry and a male tab (or blade) connector where the sides of the "U" are bowed inwardly to form a spring wipe-contact with any tab connector inserted therebetween and where the female connector extends through the board and is clinched in position thereon without piercing the printed circuitry so as to bring the free ends of the "U" into positive electrical contact with the printed circuitry.

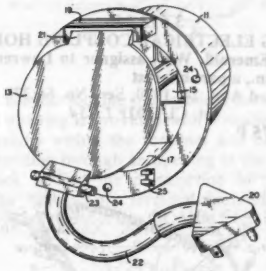


3,613,044

POWER SUPPLY CORD HATCH

Willis G. Rarick, New Paris, Ind., assignor to Lyall Electric, Inc., Albion, Ind.

Filed Dec. 11, 1969, Ser. No. 884,300
Int. Cl. H01r *13/44*
U.S. Cl. 339—44 R **4 Claims**



An improved hatch for a power supply cord to be used on travel trailers and similar structures wherein it is desired to store within the structure a power supply cord and, from time to time, extract that cord and connect it to a source of electrical current is disclosed. The latch is fabricated in two pieces from nylon or other thermoplastic material and designed to be moisture resistant. A novely configured rear portion of the hatch is designed to flexibly pass an electrical plug during assembly and to pass (without flexing) the power cord during use.

3,613,045

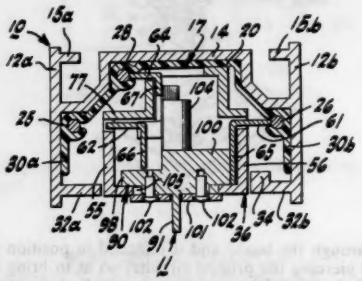
ADAPTER FOR A POWER DISTRIBUTION SYSTEM

Larry L. Routh, Castro Valley, and James Contratto, Livermore, both of Calif., assignors to U.S. Industries, Inc., New York, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,335
Int. Cl. H01r *9/00*
U.S. Cl. 339—21 R **21 Claims**

A male adapter or plug for connecting an electric fixture to a power distribution system of the type providing a substantially continuous convenience outlet enabling adapters to be connected thereto at substantially any selected location along the system. The system includes one or more track components that provide such convenience outlet each of which is equipped with a conductor assembly having a plu-

rality of pairs of conductors extending therealong in insulated relation one from the others. The adapter is operative to mechanically secure an electric fixture to the track component and to electrically connect such fixture selectively to one or another of the pairs of conductors. For this purpose, the adapter comprises support structure releasably interconnectable with the track component, a plurality of pairs of contacts selectively moveable between an inner retracted neutral position and outer extended positions for respective



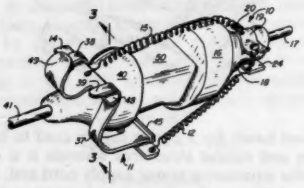
engagement with the pairs of conductors, selector structure movable from a neutral position into one or another of a plurality of operative positions to displace one or another of the pairs of contacts selectively into their outer extended positions, and polarization means for enforcing a predetermined relative orientation upon the track component and adapter so as to relate the operative positions of the selector structure to the respective pairs of conductors provided by the track component.

3,613,046

BIASING ELECTRICAL COUPLING HOLDER

Ivan E. Kirk, Emerald, Wis., assignor to Lawrence C. Kirk, St. Paul, Minn., a part interest

Filed Aug. 24, 1970, Ser. No. 66,378
Int. Cl. H01r *13/54*
U.S. Cl. 339—75 P **10 Claims**



The holder retains in-line slidably disengageable electric plug members coupled together for continuous electrical connection between the cables extending from the plug members at each end of the coupling.

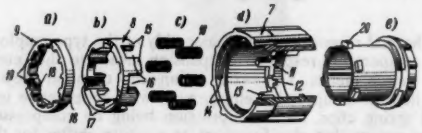
The holder includes a clamp member or means which is mounted upon the base portion of a first plug member at one end of the coupling. The holder also includes a bifurcated means comprising an adjustable yoke and two arms extending from the yoke in substantially parallel aligned spaced relationship. The terminal ends of these arms are turned laterally to form a bifurcated lock-receiving hook recess. This bifurcated means is fitted over the base portion of the second plug member at the other end of the coupling in such a manner that one arm of the bifurcated means extends on each side of the cable connection to that second plug member. Also, the terminal ends of the arms of the bifurcated member are so positioned that they project in a direction away from the coupling. A biasing resilient connection (such as a coil spring) extends between the clamp means at the base portion of the first plug member and the bifurcated means at the base portion of the second plug member. Lock bar means is removably nested in the bifurcated lock-receiving hook recess formed by the outwardly turned terminal ends of the arms of the bifurcated means. A further or second biasing resilient connection extends between the lock bar and the clamp. The resilient connections between the bifurcated means and the clamp means, and between the lock bar means and the clamp means, serve to place a constant compressive force upon the coupling; and this constant compressive force biases the first and second plug members of the coupling toward each other.

3,613,047

PLUG-AND-SOCKET CONNECTOR

Jury Grigorievich Kron, ulitsa Mira, 324 A, kv. 4; Vyacheslav Nikolaevich Solovtsov, proezd Bratsky, 7, kv. 7, and Viktor Vasilievich Rodoman, ulitsa Mira, 463, kv. 68, all of Stavropol, U.S.S.R.

Filed Oct. 20, 1969, Ser. No. 867,684
Claims priority, application U.S.S.R., Oct. 18, 1968, 1273751
Int. Cl. H01r *13/54*
U.S. Cl. 339—89 R **4 Claims**



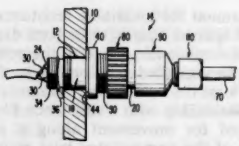
A plug-and-socket connector for connecting two lengths e.g. two lengths of an electric cable, particularly, under adverse operation conditions (i.e. when the connection is acted upon by dust, mud, water, vibrations, jogging, impacts, etc.), comprising a male plug member, a female receptacle member and a coupling and locking assembly mounted, preferably, on the body of said male plug member, this coupling and locking assembly including an external nut and two rings received internally of said external nut and extending about the body of the male plug member; the herein disclosed plug-and-socket connector features a dependable and comparatively simple structure of its coupling and locking assembly; the main parts of this plug-and-socket connector may be made of a strong plastic material.

3,613,048

WATERPROOF ELECTRICAL CONNECTOR

Paul Brundza, 662 97th St., Marathon, Fla.

Filed Jan. 18, 1968, Ser. No. 698,780
Int. Cl. H01r *13/54*
U.S. Cl. 339—89 R **5 Claims**



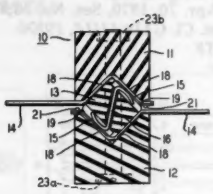
The connector includes a male and female member adapted to be interconnected with one another, and a fastening member draws the male and female members together to form a waterproof seal therebetween by means of a suitable sealing means. A clamping member is mounted on the male member for clamping the male member in place within a hole in a suitable support means and for providing a waterproof seal therewith. Adapter means and compressing means are also supported on the female connector member to provide an effective waterproof seal between the female connector member and an electrical lead means associated therewith.

3,613,049

CONNECTOR FOR FLAT MULTICONDUCTOR CABLES

Joseph M. Niedzwiecki, Brick Town, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 1, 1969, Ser. No. 881,064
Int. Cl. H01r 13/54
U.S. Cl. 339—92 M 8 Claims



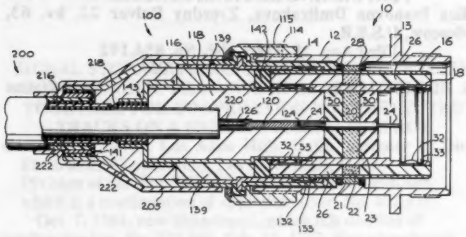
A connector for use with multiple conductor flat cables is disclosed which contains two clamp blocks, a center block and a number of contact members. The clamp blocks are positioned on either side of the center block and the contact members are located within the body of the center block.

3,613,050

HERMETICALLY SEALED COAXIAL CONNECTING MEANS

Robert L. Andrews, Simi, Calif., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed June 11, 1969, Ser. No. 832,177
Int. Cl. H01r 17/08; H05k 5/06
U.S. Cl. 339—177 R 6 Claims



A hermetically sealed coaxial four-conductor feedthrough connecting device having glass insulating rings heat-bonded between the conductors. The outer conductor is chosen to have a thermal coefficient of expansion sufficiently greater than that of the glass rings and inner conductors so as to cause a resultant compressive force to be exerted thereon which is sufficient to achieve reliable hermetic sealing of the device despite any mismatching between the thermal coefficients of expansion of the glass and the conductors.

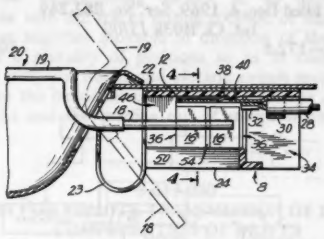
3,613,051

ELECTRICAL CONNECTOR AND ASSEMBLY

Earl Earnest Folkenroth, Harrisburg, Pa.; Harry John Dell, Norman, Okla., and William Joseph Garver, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 7, 1969, Ser. No. 813,927
Int. Cl. H01r 13/10
U.S. Cl. 339—191 A 13 Claims

A heating element connector and assembly, particularly useful for electric cooking ranges, formed as a U-shaped female connector with folded-over internal wings for making spring contact with a terminal pin of the heating element laid therein. Said connector being captured in a dielectric housing which is slotted longitudinally and vertically to permit access of the terminal pin to the U-shaped connector and which



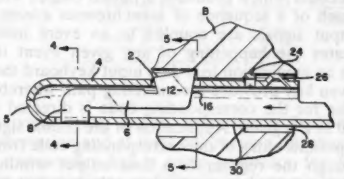
housing is dimensioned to prevent over-stressing of the material of the connector.

3,613,052

ELECTRICAL LOCKING PIN TERMINAL

Frederick Jean Maltais, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 27, 1970, Ser. No. 6,104
Int. Cl. H01r 9/12
U.S. Cl. 339—217 S 7 Claims



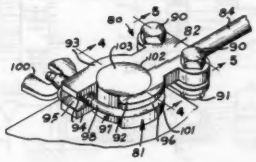
A hollow tubular locking pin terminal for securement in a sphinctered opening is provided with a resilient lance means extending axially within the terminal and having a locking member extending through an opening in the wall of the terminal to lock behind the constriction in the sphinctered opening. The tubular pin terminal including the resilient lance and locking member are all made from a unitary blank.

3,613,053

BATTERY TERMINAL CONNECTOR

Orrin H. Thomas, 2120 W. 4th St., Williamsport, Pa.

Filed Oct. 8, 1969, Ser. No. 864,746
Int. Cl. H01r 11/26
U.S. Cl. 339—231 4 Claims



A battery terminal connector for connecting a power cable to a battery post, wherein there is provided a member that is adapted to be actuated to effectively clamp the device onto the post of a battery.

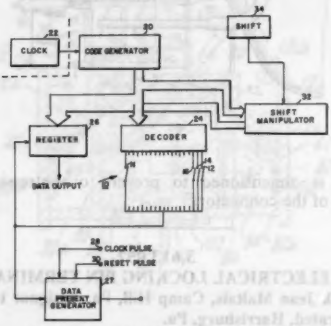
ERRATUM

For Class 290—52 see:
Patent No. 3,612,598

3,613,054
SCANNING ENCODER

Carl A. Ricard, Hudson, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Dec. 4, 1969, Ser. No. 882,249
Int. Cl. H03k *13/00*
U.S. Cl. 340—172.5 10 Claims

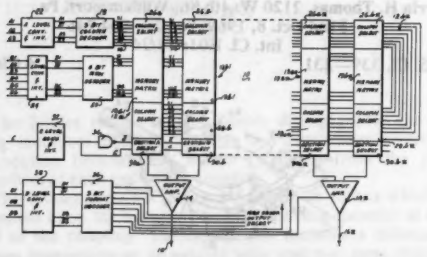


A scanning encoder comprises a code-generating means such as a binary counter which directly outputs a desired code to a decoder which produces a pulsed output which is unique to each of a sequence of asynchronous events. The decoder output signals are coupled to an event indicator which indicates the happening of any given event in the sequence. In an application to a data input keyboard the closure of a given key provides a conducting path whereby the decoder pulse for the corresponding code is directed as an enable signal to a register. Application of the enable signal to the register permits entry of the corresponding code from the counter through the register to a data output terminal. A shift means is provided to manipulate selected data bits to obtain for example upper and lower case characters or the like.

3,613,055
READ-ONLY MEMORY UTILIZING SERVICE COLUMN SWITCHING TECHNIQUES

Andrew G. Varadi, 85-15 Main St., Jamaica, N.Y., and Richard B. Rubinstein, 245 E. 19th St., New York, N.Y.

Filed Dec. 23, 1969, Ser. No. 887,496
Int. Cl. G11c *17/00*
U.S. Cl. 340—173 SP 6 Claims

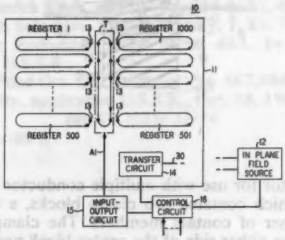


A read-only memory comprises first and second sections each of which contains a data-storing matrix. For each data readout operation each matrix is simultaneously addressed and one of the sections is selected. The output line of the unselected section is unconditionally charged to a reference potential. That potential is selectively transferred to an output circuit through a first switch controlled by a data signal derived at the output line of the selected memory section, and that reference potential simultaneously actuates a second switch to transfer the data signal from the selected column output line to the output circuit, thereby to achieve a more rapid retrieval of data from the memory.

3,613,056
MAGNETIC DEVICES UTILIZING GARNET COMPOSITIONS

Andrew Henry Bobeck, Chatham; Paul Herman Schmidt, Chatham; Edward Guerrant Spencer, Murray Hill; Le Grand Gerard Van Uitert, Morris Township, Morris County, and Edward Martin Walters, Somerset, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Apr. 20, 1970, Ser. No. 30,072
Int. Cl. G11c *11/14, 19/00*
U.S. Cl. 340—174 TF 7 Claims

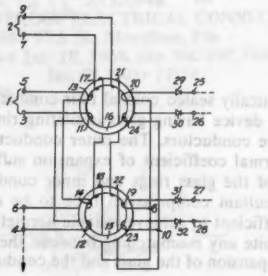


Uniaxial magnetic anisotropy in supposedly isotropic garnet compositions is found to be related to growth direction of the crystal. Wafers cut from crystalline sections, selected such that growth direction is consistent with formation of but a single 211 face, are usefully incorporated in bubble domain devices—a class of magnetic devices in which information is represented by enclosed single domain regions of polarity opposite to that of immediately surrounding material.

3,613,057
MAGNETIC ELEMENT PARTICULARLY FOR PERFORMING LOGICAL FUNCTIONS

Galina Ivanovna Dmitrakova, Zvezdny Bulvar 22, kv. 63, Moscow, U.S.S.R.

Filed Aug. 29, 1969, Ser. No. 854,192
Int. Cl. G11c *7/00, 11/06*
U.S. Cl. 340—174 R 3 Claims



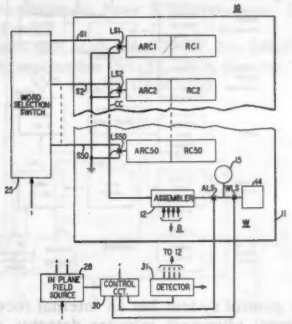
A magnetic logical element, particularly, for performing logical operations, comprising cores having wound thereabout input windings, output windings and readout windings, each one of the cores having at least one additional winding wound thereabout and connected to the output windings similarly to the readout windings, this additional winding making up together with said readout windings an additional input, with one of the input signals being supplied to this additional input during each one of the successive readout cycles.

3,613,058

MAGNETIC DOMAIN PROPAGATION ARRANGEMENT

Peter I. Bonyhard, Newark; Donald E. Kish, North Plainfield, and James L. Smith, Somerset, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 20, 1969, Ser. No. 878,366
Int. Cl. G11c *21/00, 11/14*
U.S. Cl. 340—174 TF 10 Claims



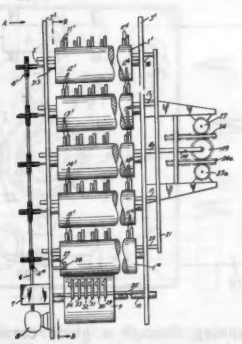
Single wall domain propagation circuits include herein both magnetically soft overlays which define propagation paths along which domains move in response to reorienting in-plane fields and electrical conductors which act on magnetically hard regions in the overlay, when pulsed, to modify locally pole patterns generated by the in-plane fields. An organization in which domains are moved in a manner to eliminate unwanted effects of current pulses in those conductors on stored domain patterns is described.

3,613,059

SIGNAL STORAGE APPARATUS WITH A PLURALITY OF MAGNETIC READ-WRITE HEADS MOVABLE TOGETHER FOR COOPERATION WITH SELECTED TRACKS ON A SIGNAL-STORING SURFACE

Gerhard H. Dirks, Los Altos Hills, Calif., assignor to Dirks Electronics Corporation, Los Altos Hills, Calif.

Division of Ser. No. 788,670, Oct. 28, 1968, abandoned, which is a continuation of application Ser. No. 402,135, Oct. 7, 1964, now abandoned, which is a division of application Ser. No. 173,908, Feb. 19, 1962, now abandoned, which is a division of application Ser. No. 617,742, Oct. 23, 1956, now Patent No. 3,049,694. Filed Feb. 24, 1970, Ser. No. 13,730
Claims priority, application Great Britain, Oct. 25, 1955, Oct. 28, 1955 and Nov. 23, 1955 30,413/55; 30,860/55; 3,350/55
Int. Cl. G11b *5/54, 21/08*
U.S. Cl. 340—174.1 C 10 Claims



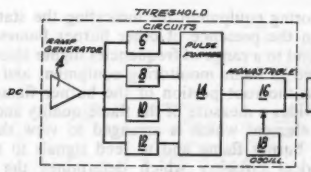
A signal storage apparatus which includes at least one storage drum rotatable about its axis and having a cylindrical signal-storing surface provided with circumferentially extending tracks, and a plurality of magnetic read-write heads disposed in a row parallel to the drum axis and located opposite the signal-storing surface so as to respectively cooperate with the tracks during rotation of the drum. The heads are together movable in direction of the drum axis between a plurality of positions so as to cooperate with selected different tracks and electric switch means are connected to the heads for controlling the storage of signals in the tracks and the reading out of stored signals from the tracks.

3,613,060

SYSTEM FOR REMOTE TRANSMISSION OF DATA AND COMPENSATION OF DRIFTS

Bernard Legrand, Manosque, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Oct. 10, 1969, Ser. No. 865,347
Claims priority, application France, Oct. 22, 1968, 170821
Int. Cl. G08c *19/22*
U.S. Cl. 340—177 4 Claims



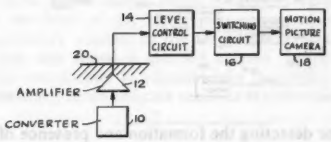
The telemetering system comprises a fixed interrogator-receiver station and at least one moving transponder station. Each transponder haS a ramp generator for producing a linearly rising voltage and threshold discriminators for forming $2n$ pulses which define in pairs n time intervals representing respectively a reference quantity and $n-1$ measured quantities. A direct current voltage linear integrator in the interrogator-receiver station comes into operation during said n time intervals. At the end of the first time interval a voltage comparator measures the difference between the voltage corresponding to the reference quantity and a local standard reference voltage. During the other $n-1$ time intervals the integrator is controlled by the comparator for the correction of the integrations during said $n-1$ intervals.

3,613,061

PRESSURE-RESPONSIVE, TIMED, ELECTRONIC CONTROL APPARATUS AND METHODS

Bryant D. Lund, 1955 Hollywood Ave., Salt Lake City, Utah

Filed Aug. 29, 1968, Ser. No. 756,201
Int. Cl. G08b *1/00*
U.S. Cl. 340—221 1 Claim

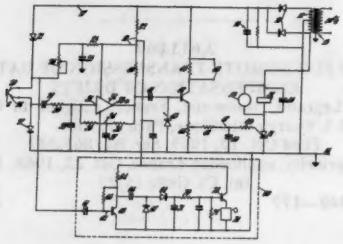


A control apparatus which includes a piezoelectric converter embedded in a pressure-carrying medium, which is electrically connected to an electronic amplifier for amplifying the voltage output of the converter. A switching circuit is electrically connected to the amplifier for activating a switch which controls the operation of a motion-picture camera when the output voltage of the converter is at a predetermined level. A second circuit is electrically connected to the switching circuit for maintaining the switch closed and opened for predetermined times.

3,613,062
FLAME QUALITY AND PRESENCE MONITOR FOR MULTIBURNER FURNACES

John A. Bloice, London, England, assignor to Memco Limited, Isleworth, Middlesex, England

Filed Feb. 10, 1969, Ser. No. 797,896
Claims priority, application Great Britain, Feb. 22, 1968, 8634/68
Int. Cl. G01j 1/42, 5/32; G08b 17/06
U.S. Cl. 340—228.2 10 Claims

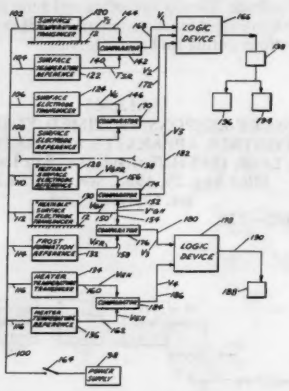


Flame-monitoring equipment for indicating the state of a burner flame in the presence of other burner flames is arranged to respond to a range of frequencies higher than those normally utilized in flame-monitoring equipment and which are confined to the root portion of the burner flame. The equipment provides a measure of the flame quality and has a light sensitive element which is arranged to view the root portion of the burner flame and to feed signals to the associated electrical circuitry which determines the flame quality from the number, rather than the amplitude, of the high frequencies present in the electrical output of the element and lying within said range.

3,613,063
SNOW DETECTING DEVICE

Michael F. Ciemochowski, Warren, Mich., assignor to Holley Carburetor Company, Warren, Mich.

Filed Sept. 23, 1968, Ser. No. 761,557
Int. Cl. G08b 21/00
U.S. Cl. 340—234 11 Claims

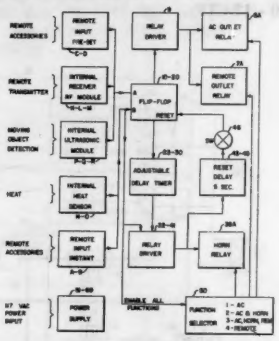


A device for detecting the formation and presence of frost, ice or snow on a surface employs signal-producing sensing means to sense the temperature of the surface, as well as the presence of either free water, frost, ice or snow. The signals produced in response thereto are compared to certain established reference values indicative of freezing temperature as well as relative electrical conductivity of free water, frost, ice or snow in order to logically determine whether it is merely free water which is being sensed or if it is actually frost, ice or snow and in accordance with such determination create an appropriate output response.

3,613,064
ALARM CONTROL

Charles H. Peterson, and Curtiss C. Krueger, both of San Diego, Calif., assignors to Defensive Instruments, Inc., Pittsburgh, Pa.

Filed Apr. 9, 1969, Ser. No. 814,537
Int. Cl. G08b 7/00, 13/00
U.S. Cl. 340—258 18 Claims

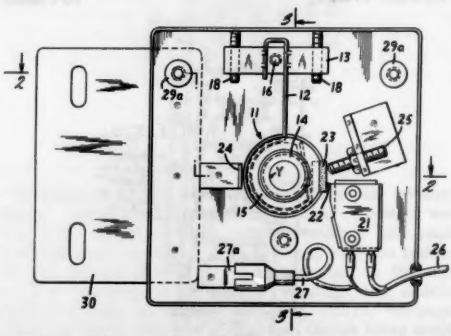


An alarm control system has an internal receiver module and an internal ultrasonic intruder detector module connected to one input channel of a bistable flip-flop. An internal heat sensor fire detector is connected to another input channel. Remote inputs are connectable to either input channel. Inputs in the first channel cause the flip-flop to change to the alarm state and to operate a relay driver which partially completes AC outlet relays and remote output relays and which starts an adjustable delay timer to operate a second relay driver for partially completing a horn relay and for partially completing a circuit to a reset delay device. A function selector selectively grounds one or more of the output relays preparatory to operation of the flip-flop and relay drivers so that the circuits are ready to operate the appropriate output when the flip-flop is biased into an alarm state. The second channel is connected directly to the second relay driver and to the function selector for overriding the function selector for grounding all relay coils so that all signals operate when an extremely hazardous condition such as fire is sensed by second channel sensors.

3,613,065
APPARATUS UTILIZING A VIBRATABLE MEMBER FOR DETECTING SUSTAINED TENSION IN A RUNNING LENGTH OR STRAND

Howard C. Lindemann, Syosset; Vladimir A. Mateyka, New Hyde Park; John P. Strack, Bohemia, and Willie A. Busch, New Rochelle, all of N.Y., assignors to Lindly & Company, Inc., Mineola, N.Y.

Filed Mar. 3, 1970, Ser. No. 16,168
Int. Cl. G08b 21/00
U.S. Cl. 340—259 16 Claims



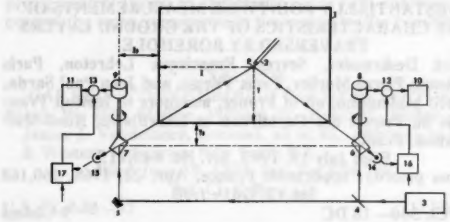
Yarn running through a guide carried by a vibratable member induces vibration of the vibratable member at its

natural frequency. A transducer converts this vibration into an electrical signal which is fed to a circuit for detecting interruption of the signal in the event the yarn breaks. In some applications excessive tension in the yarn which may lead to breakage is detected before a break occurs either by detecting abnormal deflection of the vibratable member or by detecting abnormally high amplitude of vibration.

3,613,066
COMPUTER INPUT EQUIPMENT

Charles R. Cooreman, Columbes, France, assignor to Compagnie Internationale Pour L'Informatique, Les Clayes-sous-Bois, France

Continuation-in-part of application Ser. No. 540,996, Apr. 7, 1966. This application Oct. 22, 1968, Ser. No. 769,520
Int. Cl. G08c 9/06
U.S. Cl. 340—347 **7 Claims**

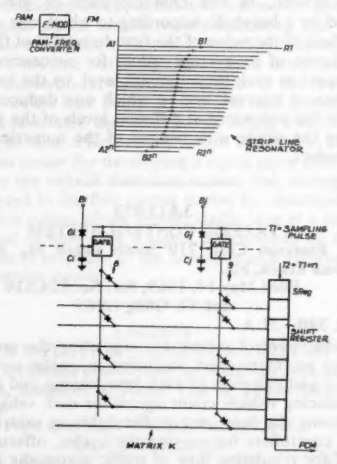


In a computer input equipment comprising a display panel and means responsive to the positions and moves of a pointer on said panel for generating information signals for the computer, thin coherent light beams parallel to the surface of said panel are systematically and repetitively displaces in crossing relation to scan part at least of said surface.

3,613,067
ANALOG-TO-DIGITAL CONVERTER WITH INTERMEDIATE FREQUENCY SIGNAL GENERATED BY ANALOG INPUT

Heinz Haberle, Stuttgart-Bad Cannstatt, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 15, 1969, Ser. No. 841,692
Claims priority, application Germany, Sept. 14, 1968, P 17 62 877.2
Int. Cl. H03k 13/175; G01r 23/02
U.S. Cl. 340—347 AD **8 Claims**

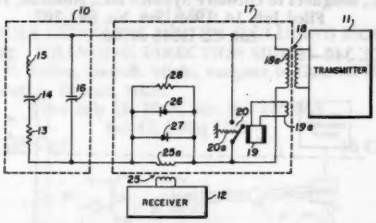


PAM samples are converted to a frequency proportional to the PAM amplitude. The resultant frequencies are applied to 2ⁿ resonators each resonant at a different frequency and representing one of 2ⁿ code groups. 2ⁿ gates, timed by the sampling signal, are each coupled to a voltage node of an associated one of the resonators and logic circuitry coupled to the gates provide the output code group for each sample dependent on the resonator excited. The resonators may be of printed strip line configuration arranged to provide linear or compression coding characteristics. A binary averaging arrangement can be provided to handle situations where the converted frequency excites two or more resonators. A gray-type code is employed to reduce coding errors when two or more resonators are excited.

3,613,068
DEVICE FOR COUPLING A TRANSDUCER TO A TRANSMITTER AND RECEIVER (U)

John H. Thompson, Pittsburgh, Pa.; Charles B. Durgin, Rochester, N.Y., and Dale D. Skinner, Turtle Creek, Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed June 30, 1969, Ser. No. 839,796
Int. Cl. G01s 9/66
U.S. Cl. 340—3 R **4 Claims**



The large capacitive reactance of piezoelectric materials such as, barium titanate, Rochelle salt, or quartz, that are used as the driving elements in transducers has required large inductances to bring the power factor to unity to ensure efficient power transfer between a transducer and a transceiver. A transmitter-transformer couples a transmitter to the transducer, at high-energy output levels, and a series connected receiver-transformer, tuned to pass signals with an identical frequency characteristic at significantly lower levels of energy, eliminates a problem arising when one transformer is used. When employing a single transformer having a high permeability core, its inductance varies when the transformer transfer energy separated levels of energy thusly changing the tuning of associated circuits at these different levels of operation. Shunting switches across the transmitter-transformer winding and the receiver-transformer winding, enable the selective disconnection of either of the transformers from a common coupling circuit when the other mode of operation is proceeding. A pair of back-to-back diodes forming the shunting circuit across the primary of the receiver-transformer, have a forward voltage drop greater than the magnitude of the received signal to ensure the transfer of received signals when they appear across the primary winding. These same diodes have a forward voltage drop far below the level of the high-power output appearing across the secondary winding of the transmitter-transformer to ensure that this signal is shorted around the primary of the receiver-transformer to eliminate the possibility of damaging the inherently more delicate receiver-transformer.

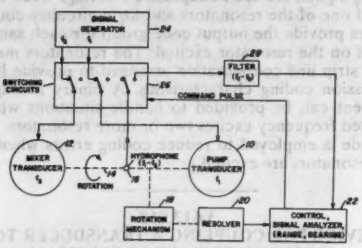
3,613,069
SONAR SYSTEM

Boyd B. Cary, Jr., Pittsford, and Francis H. Fenlon, Rochester, both of N.Y., assignors to General Dynamics Corporation

Filed Sept. 22, 1969, Ser. No. 859,675
Int. Cl. G01s 9/68
U.S. Cl. 340—3 R **16 Claims**

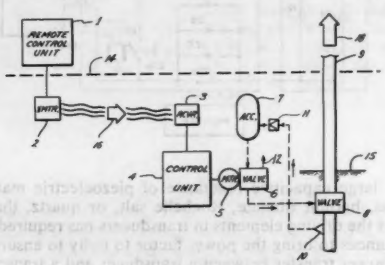
A sonar system is described which operates by parametrically interacting two ultrasonic waves of different frequency,

at least one of which is of finite amplitude. The resulting wave due to the intermodulation component overrides the



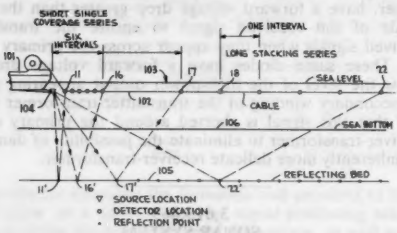
signal level of the primary waves at long ranges from the sources thereon and has high directivity.

3,613,070
CONTROL SYSTEM FOR UNDERWATER VALVE
Durward B. Jones, and William C. Hall, both of Houston, Tex., assignors to Offshore Systems Inc., Houston, Tex.
Filed July 14, 1969, Ser. No. 841,207
Int. Cl. H04b *11/00*
U.S. Cl. 340—5 R **20 Claims**



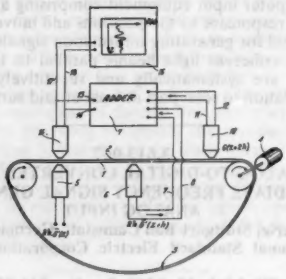
There is provided a control system for remotely opening or closing flow lines, for example oil wells.

3,613,071
SIMULTANEOUS DUAL SEISMIC SPREAD CONFIGURATION FOR DETERMINING DATA PROCESSING OF EXTENSIVE SEISMIC DATA
Roy G. Quay, San Antonio, Tex., assignor to Petty Geophysical Engineering Company, San Antonio, Tex.
Filed Dec. 24, 1969, Ser. No. 888,044
Int. Cl. G01v *2/16*
U.S. Cl. 340—7 **13 Claims**



Signals from the same seismic source are simultaneously recorded from two groups of seismic detector arrays. The two groups have detector arrays and array intervals unique to each group. The group closest to the seismic source accentuates shallow reflections and is characterized by: (1) closely spaced detectors in each array forming short arrays with short distances between array centers, (2) nearness to the source, (3) usually sampled and filtered to resolve high-frequency data, and (4) a low order of multiple coverage. The group more remote from the seismic source enhances the deeper reflections and is characterized by: (1) long arrays with long distances between array centers, (2) a location a mile or two from the source, (3) sampling and filtering to resolve low-frequency data, and (4) a high order of multiple coverage. A factor, i.e., number of detector arrays times the spacing between array centers divided by the multiplicity of coverage, for one group must be equal to the corresponding factor for the other group, although the multiplicities of coverage of the two groups are very different. The near group data determines the processing techniques and corrections for the mass of data from the far group.

3,613,072
METHOD AND APPARATUS TO EFFECT SUBSTANTIALLY POINTWISE MEASUREMENTS OF THE CHARACTERISTICS OF THE GROUND LAYERS TRAVERSED BY BOREHOLE
Robert Desbrandes, Sevres; Francisque Lebreton, Paris Vileme; Pierre Morlier, Paris Vileme, and Jean Paul Sarda, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison, France
Filed July 18, 1969, Ser. No. 843,115
Claims priority, application France, Apr. 22, 1968, 160,168
Int. Cl. G01v *1/40*
U.S. Cl. 340—18 DC **9 Claims**

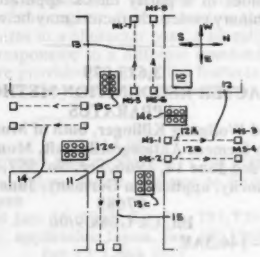


A method and apparatus to effect measurements, substantially pointwise, of the characteristics of ground layers traversed by a borehole, according to which one determines the product of the value of the first derivative of the parameter, in terms of its average values for successive intervals, with respect to each measurement level, by the height of the measurement interval, and in which one deduces the local values of the parameter at different levels of the ground surrounding the sonde with the aid of the numerical value of such product.

3,613,073
TRAFFIC CONTROL SYSTEM
Eugene Emerson Clift, 719 South Beach St., Apt. 309-B, Daytona Beach, Fla.
Filed May 14, 1969, Ser. No. 824,520
Int. Cl. G08g *1/065*
U.S. Cl. 340—31 A **21 Claims**

A traffic control system for regulating the movement of traffic at an intersection, including magnetic sensors at the entrance and exit ends of each lane leaving said intersection for producing vehicle count signals for each vehicle entering and leaving the lane, and traffic lights at said intersection having controllers for varying the cycles, offsets and splits thereof for regulating flow of traffic across the intersection into each of said lanes. Counters respond to the count signals for determining the number of vehicles in each selected

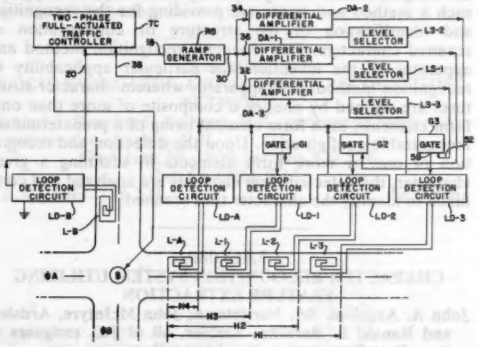
street block and logic means respond to the counters for determining the direction of the greatest traffic flow and applying control signals to said traffic signal light controllers to control the same in response to the sensed traffic conditions.



3,613,074
GAP REDUCTION THROUGH USE OF DETECTORS

Frank W. Hill, Moline; William W. Huppert, Moline, and James J. Vandemore, Geneseo, all of Ill., assignors to Gulf & Western Industries, New York, N.Y.

Filed June 19, 1969, Ser. No. 834,758
Int. Cl. G08g *1/08*
U.S. Cl. 340—37 **22 Claims**



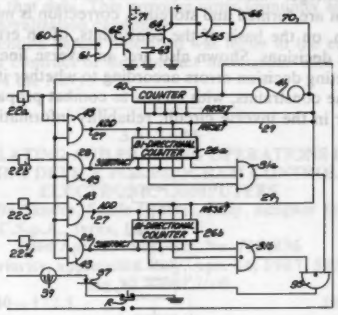
There is disclosed an apparatus and method for controlling a traffic signal means for alternately allocating "go" and "stop" signals to at least a first and second conflicting traffic lane wherein the first traffic lane has vehicle detection means associated therewith for detecting vehicles in the first phase, the second traffic lane has at least a first and second detection means associated therewith for detecting vehicles in the second traffic lane, a first circuit means coupled to the vehicle detection means for developing a signal upon detection of a vehicle by the vehicle detection means; and, timing circuit means coupled to the first circuit means for deactivating the first detection means of the second traffic lane at a predetermined period of time after a signal is developed by the first circuit means in response to the detection of a vehicle by the vehicle detection means.

3,613,075
TIRE INFLATION MONITORING SYSTEM

Thomas C. Griffiths, and Melvin R. Simpson, both of Chardon, Ohio, assignors to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed Oct. 16, 1969, Ser. No. 867,046
Int. Cl. B60c *23/04*
U.S. Cl. 340—58 **8 Claims**

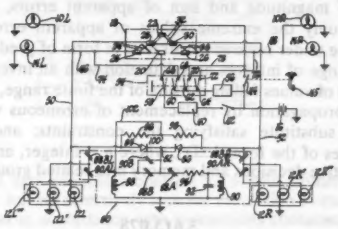
Tire inflation is monitored by sensing the angular movement of a wheel by counting revolutions of the wheel and comparing the count with a count from another wheel or a reference to determine whether or not the wheel has the proper diameter. A low speed reset system is provided to prevent false indications that might occur when the vehicle is operating at slow speeds.



3,613,076
VEHICLE SIGNALING SYSTEM INCLUDING MODE CHANGING DIRECTION SIGNAL

Richard P. Ballou, Howell, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 18, 1968, Ser. No. 745,868
Int. Cl. B60q *1/38*
U.S. Cl. 340—67 **16 Claims**



A system for energizing left and right front signal lamps and three left and right rear signal lamps to indicate impending changes in vehicle direction and/or speed or an emergency condition of the vehicle is disclosed. In a preferred embodiment of the invention a timer which includes a single time delay relay which is energizable by actuation of a direction signal switch in either direction signaling position is effective to time the sequential energization of the three rear signal lamps. The timer is also energizable by actuation of a stop signal switch to provide simultaneous and continuous energization of all the rear signal lamps and is further energizable by a hazard warning switch to provide simultaneous flashing of all the front and rear signal lamps. In each of the several embodiments disclosed the direction signal indication changes from a sequential mode to a simultaneous flashing mode upon actuation of the stop signal switch subsequent to actuation of the direction signal switch to indicate an impending deceleration of the vehicle preparatory to a change in direction of the vehicle.

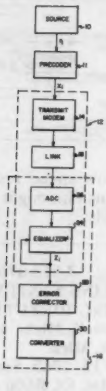
3,613,077
ERROR CORRECTION IN SAMPLED-DATA CIRCUITS

George David Forney, Jr., Lexington, Mass., assignor to Codex Corporation, Watertown, Mass.

Filed Aug. 25, 1969, Ser. No. 852,539
Int. Cl. G08c *25/00*
U.S. Cl. 340—146.1 **11 Claims**

Error correction in modems and similar sampled-data circuits that have outputs representable as outputs of a linear

circuit with integer-valued impulse response when the integer-valued input sequence is subject to predetermined constraints. Integer-valued tentative decisions and reliability information are formed and stored. A correction is made upon detection, on the basis of the constraints, of an error in the tentative decisions. Shown also are: an inverse linear circuit for detecting decision errors according to whether its outputs satisfy the constraints, with means to combat propagation of the error in the inverse circuit; reliability information in the

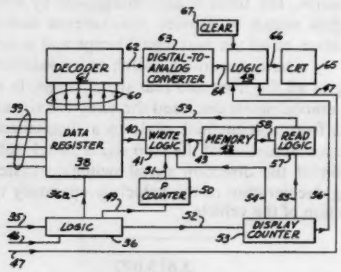


form of magnitude and sign of apparent errors, especially storing only the extreme values of apparent errors in the sequence under review; constraints in form of predetermined finite range of integers and detection with an inverse circuit on basis of values falling outside of the finite range, also combating propagation by replacement of erroneous value with closest substitute satisfying the constraints; and impulse responses of the form $1 \pm D^n$, where n = integer, and division of tentative decisions and memory into related groups.

3,613,078
APPARATUS FOR MONITORING BINARY CODED COMMUNICATIONS

Richard A. Manning, Torrance, and Frank H. Waver, Culver City, both of Calif., assignors to Computer Sciences Corporation, Los Angeles, Calif.

Filed Sept. 23, 1969, Ser. No. 866,788
Int. Cl. H04j 3/14; H04n 1/32; G07h 5/08
U.S. Cl. 340—146.1 **24 Claims**

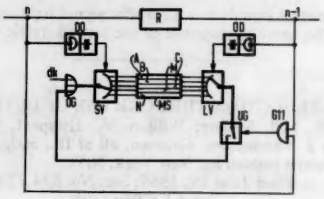


Monitoring apparatus according to the present disclosure is capable of monitoring binary coded communications between a plurality of stations. The apparatus includes receiver means for receiving binary signal and register means for sampling received binary signals in such a manner that they may be stored into memory means. Display means is provided for retrieving and displaying alpha-numeric representations of the binary signals so that the individual characters of the binary coded communications may be displayed on the display read-out. One feature of the monitoring apparatus resides in a parity check apparatus wherein the parity of the binary coded characters may be verified.

3,613,079
CHARACTER RECOGNITION METHOD AND APPARATUS

Rolf Jurk, and Wolfgang Killinger, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 14, 1966, Ser. No. 557,462
Claims priority, application Germany, June 18, 1965, S 97685
Int. Cl. G06k 9/00
U.S. Cl. 340—146.3AE **32 Claims**

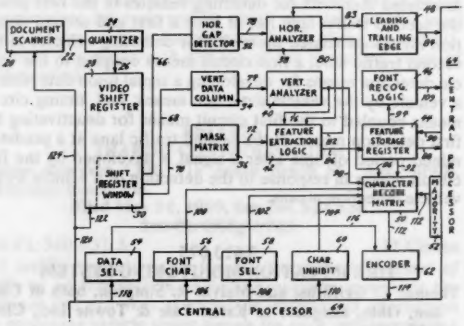


This invention relates to a method of, and apparatus for, effecting character recognition and, more particularly, to such a method and apparatus providing for the recognition and identification of the structure or configuration of scanned characters. The character recognition method and apparatus of the invention has particular applicability to recognition methods and apparatus wherein character structures are defined by one, or a composite of more than one, form elements, each form element being of a predetermined, recognizable configuration. Upon the detection and recognition of one or more form elements in scanning a given character, the detected form elements are analyzed and combined to identify the character thus scanned.

3,613,080
CHARACTER RECOGNITION SYSTEM UTILIZING FEATURE EXTRACTION

John A. Angeloni, Sr., Norristown; John McIntyre, Ardsley, and Ronald L. Baracka, Ambler, all of Pa., assignors to Scan-Data Corporation, Norristown, Pa.

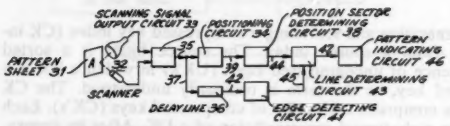
Filed Nov. 8, 1968, Ser. No. 774,280
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3AC **5 Claims**



A character recognition system having a shift register including a plurality of stages for serially storing and shifting a binary quantization of a character pattern sampled within a field on a document. Means are provided for recognizing a

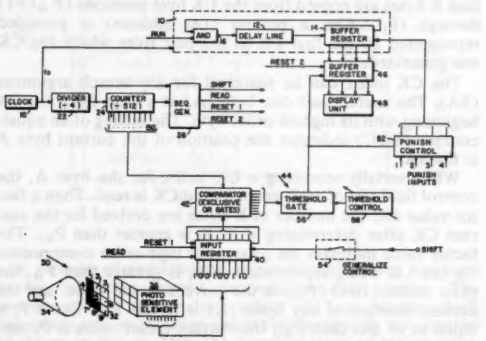
character in the register. The means comprise a plurality of subfeature masks each of which is responsive to a different combination of stages of the shift register. The feature masks are connected only to selected ones of the stages of the shift register which correspond to an area of the field. The selected stages of the register form a window through which each of the features in a character pass, a plurality of feature detectors each responsive to a different combination of subfeature masks are provided to detect the features present in a character pattern as they pass through the window.

3,613,081
PATTERN RECOGNIZING CIRCUIT
Naoki Morimoto, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Jan. 16, 1969, Ser. No. 791,739
Claims priority, application Japan, Jan. 18, 1968, 43-2744
Int. Cl. G06k *9/04*
U.S. Cl. 340—146.3 H **1 Claim**



A position sector determining circuit of a pattern recognizing circuit is connected to pattern scanning apparatus and determines the distance between a side of a polygon forming a polygonal area enclosing the pattern and an edge of a line segment of the pattern closest the side.

3,613,082
LOGIC EVALUATOR AND ADAPTIVE RECOGNITION NETWORK
Richard J. Bouchard, Amherst, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed June 30, 1969, Ser. No. 837,576
Int. Cl. G06k *9/12*
U.S. Cl. 340—146.3 H **18 Claims**



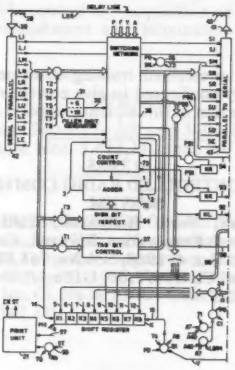
A pattern recognition system employs an addressable memory which stores response data concerning patterns. Each input pattern is presented to the system as a binary number and each such number addresses the memory so that response data is read out of the correspondingly numbered memory address. If the data read out of the memory in response to a particular input pattern is not correct, the data in the memory is changed so that the next time that particular pattern is presented to the system, the correct response data is read out of the memory.

Binary numbers corresponding to variants to an input pattern can be shifted around in an input register until they correspond to the input pattern number so that the system will respond to these variants as though they were the original input pattern.

An adjustable threshold control enables an input pattern to address the memory so that the desired response data is read out of the memory even though there is a discrepancy between the input pattern number and the memory address containing that data. This provides noise immunity as well as further generalization capability.

The invention herein described was made in the course of or under a contract or subcontract thereunder with the Department of the Navy.

3,613,083
TABULATING AND PRINTING OPERATIONS IN A PRINTING DEVICE FOR PROGRAM CONTROLLED ELECTRONIC COMPUTERS
Giovanni De Sandre, Sacile (Udine), Italy, assignor to Ing. C. Olivetti C.S.p.A., Ivrea, Italy
Filed Apr. 9, 1968, Ser. No. 719,936
Claims priority, application Italy, Apr. 14, 1967, 51328/67
Int. Cl. G06f *3/10*
U.S. Cl. 340—172.5 **10 Claims**

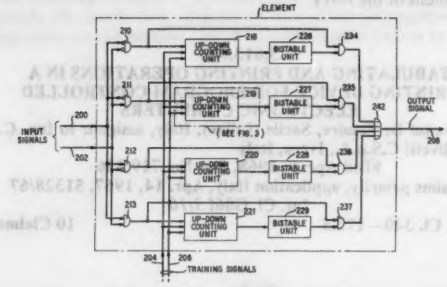


A digital data processor controls an output printer, e.g. a typewriter, having selectively settable tabulation stops. These stops are set in accordance with instructions contained in the processor program preferably as a subprogram written in from a card. A plurality of such cards can be used to set up readily any desired tabulation format. The transmission of characters to the printer is controlled by a tag bit identifying the character to be printed. The invention further concerns means controlling the initial insertion of the tag bit, the shift of the tag bit from character to character and use of the tag bit to control carriage return and resumption of printing when the number of characters in a register exceeds the length of the printing line.

3,613,084
TRAINABLE DIGITAL APPARATUS
William W. Armstrong, St. Laurent, Quebec, Canada, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Sept. 24, 1968, Ser. No. 761,936
Int. Cl. G06f *15/18*
U.S. Cl. 340—172.5 **2 Claims**

A plurality of all-digital elements are interconnected to form an *n*-input single-output network that can be structurally organized during a training or learning period to implement specified logical functions of *n* variables. Actually, for up to about 10 input variables, any desired Boolean function may be implemented by training a single element. For larger numbers of input variables, a wide class of functions may be implemented by training a multielement network. During training (for an array that contains either a single element or a plurality of interconnected elements) the response of the array is monitored and compared with the desired response for each of a set of input signals. As a result of each comparison operation, identical binary training signals are

simultaneously applied to every element of the array. These signals may cause the internal states of the element(s) to change. By systematically changing these individual states in

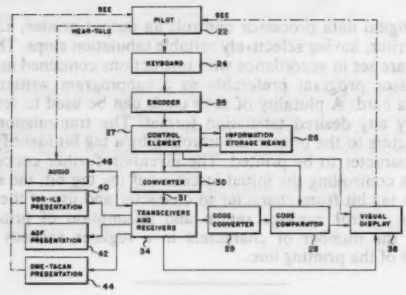


accordance with prescribed training strategies, the overall array is ultimately configured to give correct responses to at least specified portion of subsequently-applied input signals.

3,613,085
DIGITALLY CONTROLLED RADIO COMMUNICATION SYSTEM

Paul L. Winskell, North Hollywood, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Oct. 4, 1968, Ser. No. 765,070
Int. Cl. G06f *1/00*; G11b *31/00*
U.S. Cl. 340—172.5 **14 Claims**

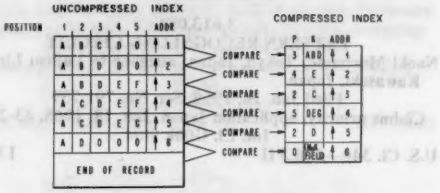


A communication and radio-navigation information storage, retrieval, control and verification system for storing in coded form all assigned communication and navigation frequencies and the identifying Morse code for various information source locations. It further includes a keyboard for selecting a source location and a particular communication or navigation function. An encoder coupled to he keyboard selectively locates and removes the coded information from storage which is representative of the source location and the function. The system responds to the selected coded information to tune a radio receiver to the frequency corresponding to the selected coded information. The coded source-location identifying signal, received by the radio receiver, is supplied to a code recognition circuit. A code comparator compares the output of the code recognition circuit and the portion of the manually selected coded information (indicative of the desired source location) to produce a visual or other output signal to the operator when parity exists.

3,613,086
COMPRESSED INDEX METHOD AND MEANS WITH SINGLE CONTROL FIELD

Edward Loizides, and John R. Lyon, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1969, Ser. No. 788,876
Int. Cl. G06f *7/22*
U.S. Cl. 340—172.5 **42 Claims**



Generating and searching a compressed key index (CK index) from a source index. The source index is a sorted sequence of uncompressed key's (UK's) in which a UK is a record key, as the term is ordinarily understood. The CK index comprises a plurality of compressed keys (CK's). Each CK is a shortened representation of a UK. After its generation, the CK index can be searched for any search argument (SA).

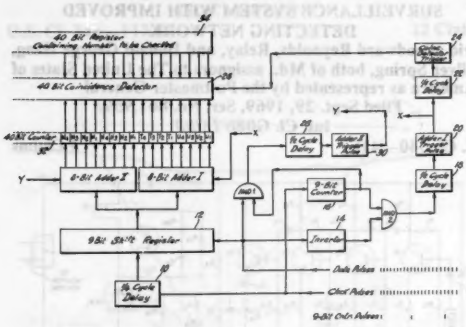
The format of a CK is generated by this invention to include a single control field (P), and at least one key (K) byte which is a byte taken from a UK. Each CK is generated from a pair of adjacent UK's taken in their sorted sequence from the source index. The pair of UK's are compared at corresponding byte positions from their highest-order bytes. The order of a byte position in a UK is determined by its significance in sorting the UK's. The control field (P) in the CK format is generated to represent the highest-order unequal byte position in the pair of compared UK's. Field (P) represents the lowest-order byte position in the CK. One key byte (K) is generated by copying a byte from the second UK in the pair at its byte location represented by the field (P). Additional key bytes are copied only when the current P (i.e. P_i) is greater than the prior generated P (i.e. P_{i1}), in which case K bytes are copied from the UK byte positions ($P_{i1}+1$) through (P_i). Also a pointer (i.e. address) is provided represented by the first UK in the pair from which the CK was generated.

The CK index can be searched for any search argument (SA). The search uses one byte (A) at a time from the SA beginning with its highest-order byte. The setting of an equal-counter (EQU) indicates the position of the current byte A in the SA.

While serially searching a CK index for the byte A, the control field (P) of each encountered CK is read. Then a factor value and the number of K bytes are derived for the current CK after determining if its P_i is greater than P_{i1}. The factor value indicates the amount of high-order compression for the UK being represented. If P_i is greater than P_{i1}, the prior control field (P_{i1}) is the current factor value, and the current number of key bytes (K) is P_i less P_{i1}. But if P_i is equal to or less than P_{i1}, the current factor value is P_i, and only one K byte exists in the current CK.

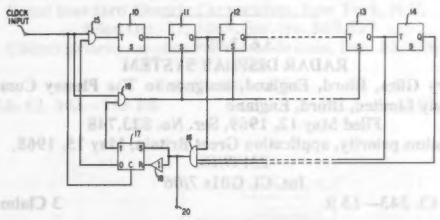
The current factor value is then compared to the current equal counter setting (EQU). If the factor value is greater than the search argument, the search continues by going to the next CK. But if they are equal, the highest-order K byte in the CK is compared with the current A byte. If A and K are equal, the next A byte and the next K byte (if any) are fetched, and they are compared. Whenever all K bytes in a CK compares equal with A bytes, or whenever any K byte is less than the A byte, the search passes to the next CK. Whenever any P_i is less than the current setting of the equal counter (EQU), or whenever any K byte compares high with the A byte, the search is completed after reading the pointer with the current CK, retrieving the pointer's record, and comparing the SA to the UK in the record for verification that the correct record has been obtained. The search is then ended in an index having an ascending sequence.

3,613,087
METHOD FOR THE CONTRACTION OF DATA
William F. Brown, Wappingers Falls, and Jerry L. Nolting, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.
Filed May 21, 1969, Ser. No. 826,310
Int. Cl. G06f 5/00
U.S. Cl. 340—172.5 3 Claims



Methodology and apparatus for representing many numbers in an ordered sequence of numbers by substitute numbers where each such substitute number consists of fewer digits than the number for which it has been substituted and storing and processing signals representative of all the numbers in the ordered sequence, including the substitute numbers.

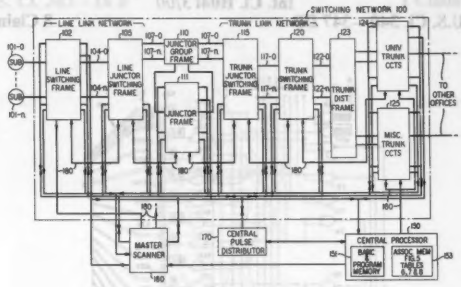
3,613,088
RIPPLE-THROUGH COUNTERS HAVING MINIMUM OUTPUT PROPAGATION DELAY TIMES
Henry T. Brendzel, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Sept. 26, 1969, Ser. No. 861,433
Int. Cl. G06f 9/06
U.S. Cl. 340—172.5 4 Claims



A process of constructing ripple-through binary counters having minimum output propagation delay times. The process utilizes the desired values of loop length, clock frequency and single-stage delay time to specify the number of stages in the counter, the terminal state of the counter, and the logic gate configuration required to reset the counter from its terminal state to its initial state. A counter constructed in accordance with this process has a minimum propagation delay before producing an output.

3,613,089
ASSOCIATIVE MEMORY CONTROL FOR A SWITCHING NETWORK
Stephen S. Karp, Gaithersburg, Md., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Oct. 28, 1969, Ser. No. 871,841
Int. Cl. G06f 7/00; H04m 7/00
U.S. Cl. 340—172.5 5 Claims

A communication system is disclosed in which paths through a multistage switching network are located by reference to information stored in associative memory.

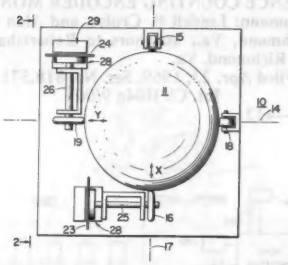


Specific methods control the acquisition of the stored information for establishment and termination of the network paths.

ERRATA

For Classes 340—174 SR and 340—347 AD see: Patent Nos. 3,613,110 thru 3,613,112

3,613,090
CURSOR CONTROL SYSTEM
Charles F. Mason, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed July 30, 1969, Ser. No. 846,143
Int. Cl. H03k 13/02; G08c 9/08
U.S. Cl. 340—347 AD 29 Claims

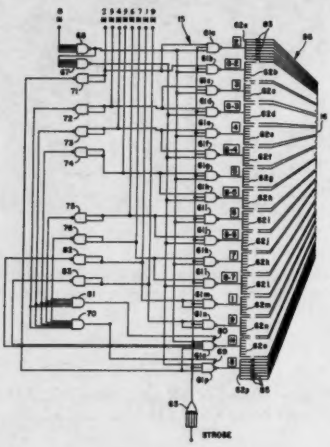


A position indicating control system includes a member mounted for selective movement in forward and reverse directions, an actuating element mounted thereon, and first, second and third sensing means respectively sensing passage of the actuating elements, the first sensing means being intermediate the second and third means. The sensing means are spaced so that the second means senses passage of the actuating element when the member is moved in one direction after the first means senses the passage and the third means senses passage of the actuating element when the member is moved in the other direction after the first means senses the passage. First and second bistable means respectively generate a first signal responsive to sensing passage in one direction of an actuating element by one of the second and third means and a second signal responsive to sensing passage in the other direction of an actuating element by the other of the second and third means to indicate the direction of movement of the member. Means are included for inhibiting the generation of signals by the bistable means except upon a predetermined sequence of sensing of the movement of the member in a particular direction by two of the three sensing means.

3,613,091
CODE TRANSLATOR

Ralph H. Thomas, Northfield, and Ronald S. Perloff, Warrensville, both of Ohio, assignors to Electron-Ohio, Inc.

Filed Oct. 6, 1969, Ser. No. 863,889
Int. Cl. H04l 3/00
U.S. Cl. 340—347 DD 8 Claims

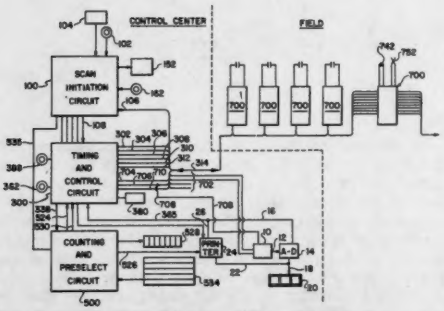


A device for translating a multibit input code into a desired multibit output code including a double-ended decoding circuit which converts the signals representing an input character into a single signal and apparatus which encodes this single signal into the signals representing a corresponding output character.

3,613,092
SEQUENCE COUNTING ENCODER MONITOR

Paul A. Schumann; Lindell P. Cruise, and Alan F. McCrea, all of Richmond, Va., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 23, 1969, Ser. No. 818,571
Int. Cl. H04q 9/00
U.S. Cl. 340—413 23 Claims

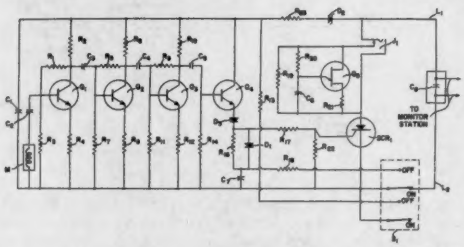


A sequence counting encoder monitoring system including a control center having a timing and control circuit for generating scanning pulses, a priority and interrupt circuit for providing scan initiation pulses and synthetic end-of-scan pulses to the timing and control circuit, and a preselect and counting circuit for indicating the encoder being monitored, for stopping a scan at a preselected encoder and for indicating the end of a scan; and a plurality of field encoders interconnected in series with the control center by a cable having a plurality of wires the number of which is determined by the number of pulses generated at the control center and the number of conditions to be sensed at the field encoders and not by the number of field encoders, each of the field encoders including a stage of a shift register to provide selective monitoring of the field encoders and pulse generators for providing acknowledge and alarm pulses.

3,613,093
SURVEILLANCE SYSTEM WITH IMPROVED DETECTING NETWORK

David Woodward Reynolds, Relay, and Donald George Haag, Silver Spring, both of Md., assignors to The United States of America as represented by the Postmaster General

Filed Sept. 29, 1969, Ser. No. 861,959
Int. Cl. G08b 13/00
U.S. Cl. 340—416 3 Claims

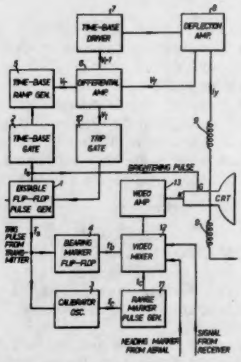


This invention relates to a surveillance system utilizing a telephone line not only for transmitting an alarm signal between an area under surveillance and a central monitoring station but also for supplying the power necessary for the operation of the system. In the operation of one embodiment of this system, electrical signals are generated by a pickup transducer in response to the detection of an intrusion into the area under surveillance, are amplified, and are supplied to a detecting network. After insuring that the signals received are the result of an actual intrusion and not the result of some extraneous noise, the detecting network is operative to trigger an alarm circuit whereby an alarm signal is transmitted via a telephone line to a central monitoring station.

3,613,094
RADAR DISPLAY SYSTEM

Henry Giles, Ilford, England, assignor to The Plessey Company Limited, Ilford, England

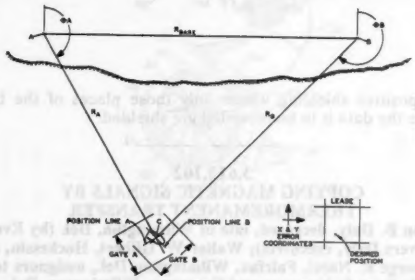
Filed May 12, 1969, Ser. No. 823,748
Claims priority, application Great Britain, May 15, 1968, 23189/68
Int. Cl. G01s 7/06
U.S. Cl. 343—13 R 3 Claims



A radar system including a digital timing system comprising division stages and gating means arranged such that all

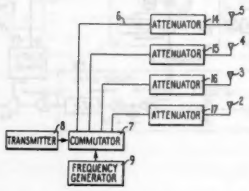
control pulses required are derived from a master oscillator or clock pulse generator.

3,613,095
METHOD OF AND APPARATUS FOR LOCATING A POSITION
Albert A. Elwood, 151 West 27th St., Riviera Beach, Fla.
Filed June 16, 1969, Ser. No. 833,638
Int. Cl. G01s 5/14
U.S. Cl. 343—112 D 12 Claims



A method of an apparatus for locating a position in which a plurality of frequency standard devices based on the action of the natural frequencies associated with transitions between energy states in atoms and/or molecules are synchronized or phase compared at the same initial location, two of the devices are placed at transmitting stations on a known base line, with the third device at a third station which receives the signals from the two transmitting stations and compares the received frequencies with its own device, then converts said phase differential into distance so as to determine the exact location of the third station.

3,613,096
RADIO BEACON
Charles William Earp, London, England, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Oct. 27, 1969, Ser. No. 869,527
Claims priority, application Great Britain, Dec. 13, 1968, 59338/68
Int. Cl. G01s 3/04
U.S. Cl. 343—113 DE 3 Claims

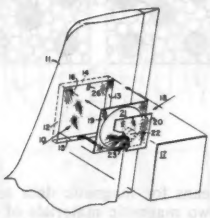


A radio beacon of the type comprising a linear array of equally spaced aerials, with a radio frequency source commutated successively to each aerial to simulate constant velocity motion of a single radiator in which the amplitude of the radiated signal is tapered from minimum amplitude at the ends of the array to maximum amplitude at the center of the array in order to eliminate the effect of phase discontinuity between successive sweeps. In a preferred embodiment, said tapering is achieved by connecting the commutator to each of the aerials via fixed attenuators. In another preferred embodiment, said tapering is achieved by modulating the radio frequency signal coupled to the commutator at the commutator rate.

3,613,097
AUTOINFLATING SEA TARGET
Raymond S. Daughenbaugh, 860 South LaLuna, Ojai, Calif.
Filed Feb. 24, 1969, Ser. No. 801,524
Int. Cl. F41j 9/12
U.S. Cl. 343—18 B 1 Claim

A sea target formed of a bag of thin, flexible, reflective material. The bag is provided with a centrally depending sleeve having a weighted airscoop at its lower end. It may be airdropped and during descent the scoop inflates the bag through the sleeve and upon water landing a column of water within the sleeve prevents loss of air. The weighted scoop and sleeve also provide a sea anchor.

3,613,098
ELECTRICALLY SMALL CAVITY ANTENNA
John Joseph Blasko, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed May 12, 1969, Ser. No. 823,566
Int. Cl. H01q 1/28
U.S. Cl. 343—708 4 Claims

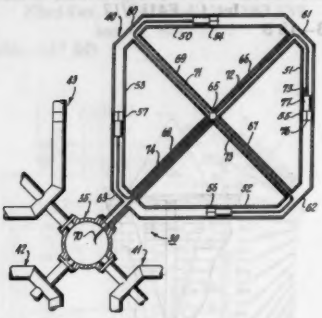


An electrically small cavity antenna especially adapted for flush mounting in an aircraft vertical stabilizer. A cavity is formed in the vertical stabilizer so as to have a pair of radiation windows or apertures on opposite sides of the stabilizer. An energy coupling device is placed substantially in the center of the cavity to couple energy from a feeding network to the cavity. The energy coupling device includes a pair of spaced-apart plates with a tapered portion disposed between the plates. Energy is coupled from the feed network to one of the plates and the narrow end or apex of the tapered portion.

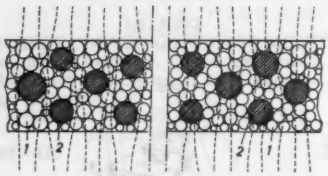
3,613,099
VOR ANTENNA SYSTEM
Clinton G. Hollins, Springfield, Va., assignor to Scanwell Laboratories, Inc., Springfield, Va.
Filed July 11, 1969, Ser. No. 841,023
Int. Cl. H01q 1/12
U.S. Cl. 343—742 4 Claims

An antenna system for radiating VOR signals wherein metal to metal contact between a central supporting mast

and loop radiating elements is used without producing mast excitation, thus providing feasible means for constructing a vertical array of VOR antenna elements.



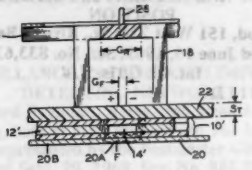
3,613,100
METHOD AND DEVICE FOR MAGNETIC IMAGE FORMATION
Helmut Kaufer, Metzkausen uber Mettmann; Erich Berger, Unterhaching Munich, and Hans Peter Huber, Munich, all of Germany, assignors to Agfa Aktiengesellschaft, Leverkusen, Germany
Filed Apr. 1, 1965, Ser. No. 444,875
Claims priority, application Germany, Apr. 4, 1964, A 45665 IXG/21 A
Int. Cl. G11b 5/02
U.S. Cl. 346—1 29 Claims



Recording means for magnetic data recording which include at least two magnetic materials of different temperature dependency with respect to at least one magnetic characteristic of the same, and a method of operating a device of such type for storing magnetic recording which includes subjecting the recording means, particularly the two magnetic materials of different temperature dependency to the influence of a magnetizing or demagnetizing field.

3,613,101
MAGNETIC RECORDING UTILIZING A SELECTIVE MAGNETIC SHIELDING STRUCTURE
Eugene Leonard, Sands Point; Edgar Wolf, New Hyde Park; Francis C. Marino, Huntington, and Wolfgang F. Heine, Huntington Station, all of N.Y., assignors to Digitronics Corporation, Albertson, N.Y.
Continuation of application Ser. No. 674,788, Oct. 12, 1967, now abandoned, which is a continuation of application Ser. No. 350,346, Mar. 9, 1964, now abandoned. This application Jan. 21, 1970, Ser. No. 4,457
Int. Cl. G11b 5/86, 5/70; G01d 15/12; G06k 19/00
U.S. Cl. 346—74 M 11 Claims

A method and apparatus for recording digital data on a magnetic tape magnetically shields discrete areas of the tape. The shielded tape is then exposed to a magnetic field to change the magnetic state of the unshielded areas. There are two types of shielding: negative shielding wherein the tape is shielded at all places except where the data is to be recorded;

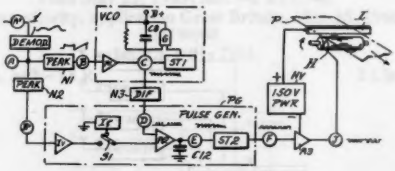


and positive shielding where only those places of the tape where the data is to be recorded are shielded.

3,613,102
COPYING MAGNETIC SIGNALS BY THERMOREMANENT TRANSFER
Nelson B. Daly, deceased, late of Wilmington, Del. (by Evelyn Silvers Daly, executrix); Walter W. Gilbert, Hockessin, and George R. Nacci, Fairfax, Wilmington, Del., assignors to E. I. de Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of application Ser. No. 464,811, June 17, 1965, now abandoned, which is a continuation-in-part of application Ser. No. 454,767, Apr. 26, 1965, now abandoned. This application Nov. 6, 1969, Ser. No. 773,974
Int. Cl. H01v 3/04
U.S. Cl. 346—74 MT 6 Claims

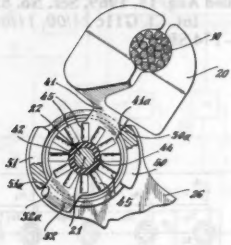
Signals on magnetic recording members, such as signals recorded on magnetic tape, can be copied by placing the recording in contact with a copying member and transiently heating the magnetic material of the copy member in the vicinity of or above the Curie transition with a pulse of radiant energy, particularly visible or infrared energy.

3,613,103
ANALOG SIGNAL MODIFYING APPARATUS
Charles H. Harris, Shrewsbury, Mass., assignor to Alden Research Foundation, Westboro, Mass.
Filed July 25, 1969, Ser. No. 844,919
Int. Cl. G01d 15/06; G03g 15/00; H04n 1/22
U.S. Cl. 346—74 R 12 Claims



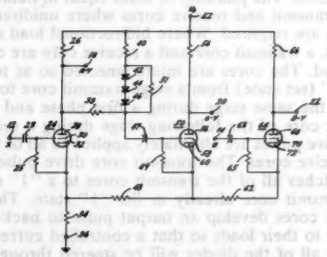
In an electrolytic paper recorder of electric signals, an analog signal is converted by a voltage controlled oscillator to a series of pulses with rises spaced in inverse proportion to the analog signal amplitude. The spaced rises trigger a pulse generator whose output is a corresponding series of constant amplitude marking pulses with a spatial density proportional to the original signal amplitude. The marking pulses are applied to the blade and helical electrodes of the recorder through a current starved amplifier which adjusts the pulse amplitude to compensate for random variations in the resistance of the electrolytic recording paper between the marking electrodes. The width of the marking pulses may be varied by a variable current source for the pulse generator so as to compensate for the nonlinear gamma characteristic of the paper.

3,613,104
SPACER DAMPER
Edward F. Bradshaw, Agincourt, Ontario, Canada, assignor to Burndy Corporation
Filed June 5, 1970, Ser. No. 43,694
Int. Cl. H02g 7/14, 7/12
U.S. Cl. 174—42 3 Claims



In a spacer damper, each wire is pivoted to the spacer damper body with a relatively delicate current conducting sleeve in the pivot axis in addition to one or more torsion devices resisting pivotal movement. Limit means for limiting pivotal movement prevent the application of radial compressive forces to said sleeve.

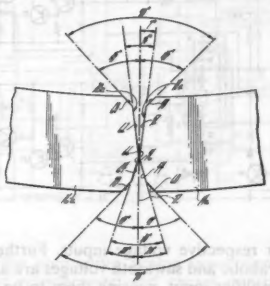
3,613,105
COLOR MATRIX CIRCUIT
Ernest C. Freeland, Huntingdon Valley, Pa., assignor to Philco Ford Corporation, Philadelphia, Pa.
Filed May 8, 1970, Ser. No. 35,730
Int. Cl. H04n 9/52
U.S. Cl. 178—5.4 MA 6 Claims



A matrix circuit for supplying drive signals to each of the three color guns in the picture tube of a color television receiver.

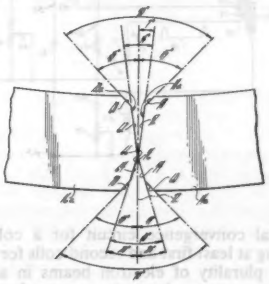
The circuit comprises three amplifying stages for supplying R–Y, G–Y, and B–Y picture tube drive signals. A portion of the R–Y output signal is supplied from the plate of the R–Y amplifier to the grid of the G–Y amplifier by a nonlinear voltage divider. Portions of each of the R–Y, G–Y, and B–Y output signals are supplied to each of the other amplifiers by means of a cathode degenerating resistor common to all three amplifiers. Additional resistance is provided in the cathode circuit of the B–Y amplifier and in the circuit common to the cathodes of the B–Y and G–Y amplifiers to adjust the relative gains of the three amplifiers and the relative portions of the R–Y, G–Y, and B–Y signals coupled to each of the amplifiers.

3,613,106
PREHEATING AND SURFACE PREPARATION FOR WELDING
Erman V. Cavagnero, Torrington, Conn., assignor to Torin Corporation, Torrington, Conn.
Division of Ser. No. 706,217, Feb. 12, 1968, Pat. No. 3,522,644, continuation-in-part of Ser. No. 473,948, July 22, 1965, abandoned.
Filed Dec. 18, 1969, Ser. No. 886,081
Int. Cl. B23k 11/02
U.S. Cl. 219—105 7 Claims



A resistance upset butt welding method wherein surfaces are V-shaped and freshly exposed within seconds of welding.

3,613,107
PREHEATING AND SURFACE PREPARATION FOR WELDING
Erman V. Cavagnero, Torrington, Conn., assignor to Torin Corporation, Torrington, Conn.
Division of Ser. No. 706,217, Feb. 12, 1968, Pat. No. 3,522,644, continuation-in-part of Ser. No. 473,948, July 22, 1965, abandoned.
Filed Dec. 18, 1969, Ser. No. 886,216
Int. Cl. B23k 11/02
U.S. Cl. 219—105 3 Claims

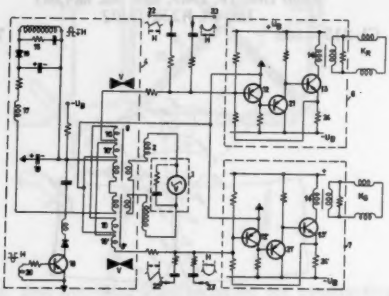


A welding method including a preparation step in the form of a scraping operation carried out in quick sequence with welding. Preheating is also accomplished with cold ends for minimal oxidation.

3,613,108
CIRCUIT FOR GENERATING CONVERGENCE COIL CURRENTS
Dieter Spannhake, Darmstadt, Germany, assignor to Fernseh G.m.b.H., Darmstadt, Germany
Continuation of application Ser. No. 702,647, Feb. 2, 1968. This application Aug. 8, 1969, Ser. No. 849,604
Int. Cl. H01j 29/50
U.S. Cl. 315—13 C 4 Claims

The horizontal frequency sawtooth currents modulated by vertical frequency sawtooth currents which are desirable for

use in the green and red convergence coils in order to make the respective scanned areas coincide are derived from horizontal sawtooth voltages modulated by vertical sawtooth voltages which exist in a distortion-compensating generator in the vertical deflection circuit, by feeding said voltages into respective ADD amplifiers whose current outputs are proportional to their respective voltage inputs. Further, horizontal frequency parabolic and sawtooth voltages are also applied at each ADD amplifier input, causing them to be added to the above-mentioned modulated voltages. The outputs of the ADD amplifiers are connected to the respective convergence coils.



3,613,109

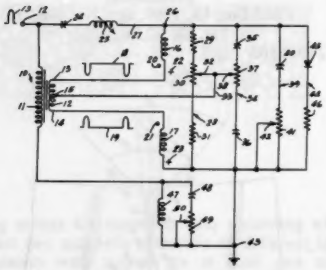
HORIZONTAL CONVERGENCE CIRCUIT

George J. Jarosz, Chicago, Ill., assignor to Admiral Corporation, Chicago, Ill.

Filed Aug. 15, 1969, Ser. No. 850,437

Int. Cl. H01j *29/50*

U.S. Cl. 315—13 C **5 Claims**



A horizontal convergence circuit for a color television receiver having at least first and second coils for magnetically converging a plurality of electron beams in a cathode-ray tube. The convergence circuit has a transformer which is coupled intermediate the two coils. This convergence transformer is coupled to the flyback transformer and is energized therefrom at the horizontal deflection rate. The two convergence coils are coupled in series with the secondary of the convergence transformer and have their polarities arranged in such a way so that the transformer produces series adding voltages across the coils. The convergence transformer has a movable core which allows the transformer to be adjusted to control the spacing between vertical test lines on the screen of the cathode-ray tube. A resistor is connected in parallel with the convergence coils and a variable tap on the resistor is coupled directly to a center tap on the secondary of the convergence transformer. This arrangement provides a differential amplitude control for the parabolic current in the coils. Further parallel connected resistors provide a differential tilt control and a master tilt control for the coils. The differential tilt control regulates the proportion of sawtooth current delivered to each coil, while the master tilt control regulates the amount of sawtooth delivered to both coils simultaneously. A single diode is coupled across both the coils and restores DC to allow the center of the parabola to be fixed at a given DC reference.

3,613,110

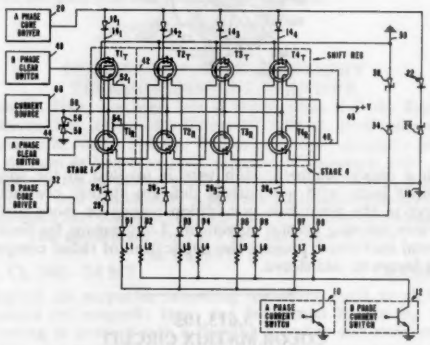
CURRENT STEERING COMMUTATOR

T. O. Paine, Administrator of the National Aeronautics and Space Administration in respect to an invention of, and Russell K. Caplette, San Gabriel, Calif.

Filed Aug. 15, 1969, Ser. No. 850,587

Int. Cl. G11c *21/00, 11/06*

U.S. Cl. 340—174 SR **8 Claims**



A commutator for steering a controlled current successively through a plurality of loads. The commutator employs a two-phase magnetic core shift register comprised of a number of stages, each stage including a transmit core and a receive core. The plurality of loads equal in number the sum of the transmit and receive cores where unidirectional load currents are required. Where bidirectional load currents are required, a transmit core and a receive core are dedicated to each load. The cores are interconnected so as to shift a binary "1" (set state) from a stage transmit core to the receive core of the same stage during a first phase and then to the transmit core of the following stage during a second phase. Core drive pulses are alternately applied to all of the transmit and receive cores. The transmit core drive pulse, for example, switches all of the transmit cores to a "1" state except that transmit core already in the "1" state. The switching transmit cores develop an output pulse to back-bias diodes coupled to their loads so that a controlled current pulse applied to all of the diodes will be steered through the diode and load coupled to the nonswitching transmit core. The transmit core drive pulse applied to the nonswitching transmit core will also switch the receive core of the same stage to a "1" state.

3,613,111

WIDE RANGE ANALOG-TO-DIGITAL CONVERTER WITH A VARIABLE GAIN AMPLIFIER

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Larry W. Moede, Manhattan Beach, Calif.

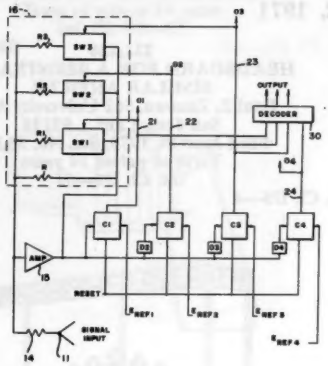
Filed Nov. 3, 1969, Ser. No. 873,259

Int. Cl. H03k *13/175*

U.S. Cl. 340—347 AD **6 Claims**

A wide range analog-to-digital converter comprising a variable gain operational amplifier to which the analog input voltage is applied. The output of the amplifier is supplied to a plurality of comparators, each one comparing the amplifier output with respect to a different threshold level and provid-

ing a true output which affects the amplifier's gain. The combined outputs of the comparators represents the converter's output digital representation.

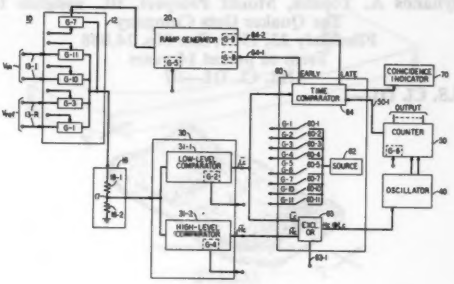


3,613,112

ANALOG-TO-DIGITAL CONVERSION AND ASSOCIATED CIRCUITRY

Daniel J. Kanter, Morris Plains, N.J., assignor to Ragen Precision Industries, Inc., North Arlington, N.J.

Filed Dec. 11, 1969, Ser. No. 884,274
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD 9 Claims



A system for converting analog input signals into their digital output counterparts, and circuit constituents of the system which are particularly suitable for realization in monolithic semiconductor integrated circuit form.

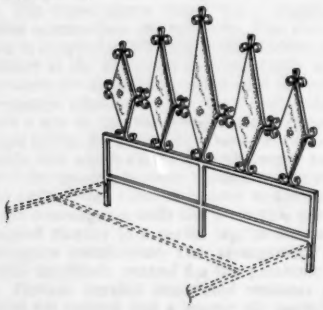
DESIGNS

OCTOBER 12, 1971

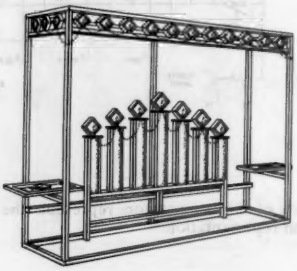
222,223
EXPANDED CEREAL FOOD PRODUCT
Stylianos A. Topalis, Mount Prospect, Ill., assignor to The Quaker Oats Company
Filed July 23, 1970, Ser. No. 24,088
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—1

222,224
LEGGING OR SIMILAR ARTICLE
Joseph Alfred Mickens, 184—14 104th Ave., Hollis, N.Y. 11412
Filed Sept. 14, 1970, Ser. No. 24,964
Term of patent 3½ years
Int. Cl. D2—*04*
U.S. Cl. D2—267

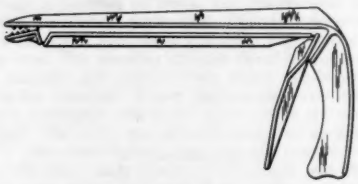
222,225
HEADBOARD OF A BED
Raul Z. Zamora, 562 University Ave., San Jose, Calif. 95110
Filed June 3, 1970, Ser. No. 23,265
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D5—4



222,226
HEADBOARD FOR A BEDSTEAD OR SIMILAR ARTICLE
Raul Z. Zamora, 562 University Ave., San Jose, Calif. 95110
Filed June 19, 1970, Ser. No. 23,571
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D5—4

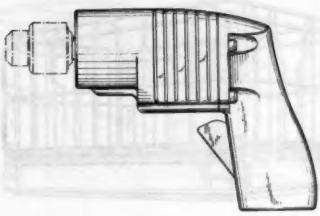


222,227
GRIPPING TOOL
John W. Rusztowicz, P.O. Box 116, Utica, Mich. 48087
Filed May 15, 1970, Ser. No. 22,997
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51

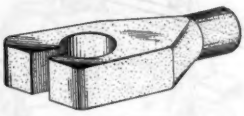


222,228
CORNICE LIFTING AND APPLYING APPARATUS
William Kreps, 15 Walnut Lane, College Park, Md. 20740
Filed June 12, 1970, Ser. No. 23,445
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51

222,229
POWER OPERATED TOOL
Raymond J. Schaedler, Utica, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.
Filed July 8, 1970, Ser. No. 23,863
Term of patent 14 years
Int. Cl. D8—05
U.S. Cl. D8—68



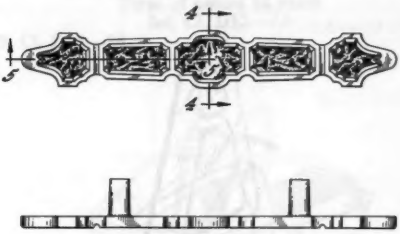
222,230
ABRASIVE TYPE HAND TOOL
Robert W. Martin, 1057 Pennington Road, Trenton, N.J. 08618
Original design application Apr. 1, 1969, Ser. No. 16,541, now Patent No. 217,952, dated July 7, 1970. Divided and this application Apr. 27, 1970, Ser. No. 22,659
Term of patent 14 years
Int. Cl. D8—05
U.S. Cl. D8—90



222,231
DRAW BOLT OR SIMILAR ARTICLE
Samuel J. Holtzman, 8201 Symphony Drive, Baltimore, Md. 21208
Filed Aug. 7, 1970, Ser. No. 24,364
Term of patent 14 years
Int. Cl. D8—06
U.S. Cl. D8—129

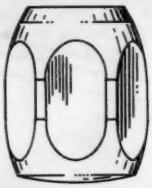
222,232
HANDLE
William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.
Filed Oct. 8, 1969, Ser. No. 19,455
Term of patent 14 years
Int. Cl. D8—03
U.S. Cl. D8—166

222,233
PULL
La Verne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Aug. 12, 1970, Ser. No. 24,455
Term of patent 14 years
Int. Cl. D8—07
U.S. Cl. D8—166



222,234
STAY FOR MAINTAINING BABY CARRIAGE HOODS AND THE LIKE IN ERECTED CONDITION
Alfred Gregory Imber, Shilton Hall, England, assignor to Geo. H. Hughes Limited, Birmingham, England
Filed Sept. 2, 1969, Ser. No. 18,947
Claims priority, application Great Britain Aug. 2, 1969
Term of patent 14 years
Int. Cl. D8—03
U.S. Cl. D8—190

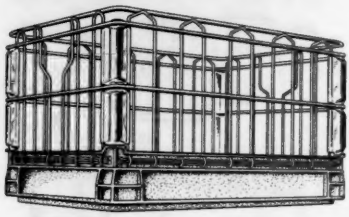
222,235
NUT
Phillip G. Holiday, Lombard, Ill., assignor to Standard Screw Company, Hartford, Conn.
Filed Apr. 7, 1970, Ser. No. 22,306
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—273



222,236
BLISTER PACKAGE DISPENSER
William M. Peragine, Wantagh, N.Y., assignor to American Sugar Company, New York, N.Y.
Filed Apr. 16, 1970, Ser. No. 22,475
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—192

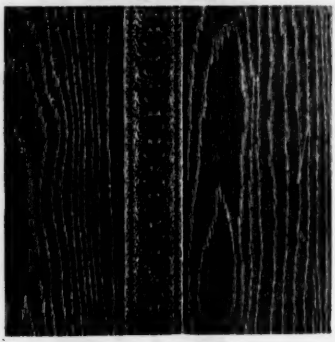
222,237
STANDABLE FLEXIBLE CONTAINER WITH STRAW
Justin M. Schmit, 3801 NE. 28th Ave., Pompano Beach, Fla. 33064
Filed Apr. 29, 1970, Ser. No. 22,709
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—194

222,238
CRATE
Houston Rehrig, 3730 E. 26th St., Los Angeles, Calif. 90023
Filed Jan. 13, 1970, Ser. No. 20,903
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—247

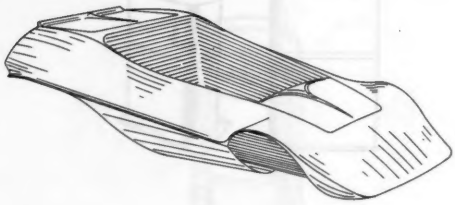


222,239
BAG CARRYING HANDLE
Joseph Yuen Mau Chan, Hong Kong, assignor to Polson Industries Co.
Filed July 27, 1970, Ser. No. 24,156
Claims priority, application Great Britain Jan. 29, 1970
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D9—292

222,240
WALL PANEL
Lester V. Ottinger, Danbury, Conn., and Donald F. Luebs, Vienna, Va., assignors to U.S. Plywood-Champion Papers Inc., New York, N.Y.
Filed June 17, 1970, Ser. No. 23,545
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1

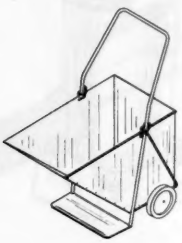


222,241
AUTOMOBILE BODY
Frederick M. Does, 4205 Wedgmont Circle S., Fort Worth, Tex. 76133
Filed May 18, 1970, Ser. No. 23,039
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3

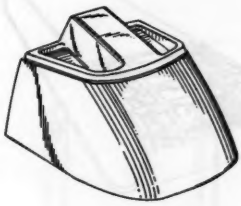


222,242
GOLF CART
John J. Delaney, West Pittston, and Henry O. Gervais, Mountaintop, Pa., assignors to Northeastern Pennsylvania Research and Development Company, Inc.
Filed May 20, 1970, Ser. No. 23,067
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—3

222,243
GARDEN CART AND TRUCK COMBINATION
Evert H. Young, 12075 Medford Drive, Los Altos, Calif. 94022
Filed Aug. 28, 1970, Ser. No. 24,758
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D14—3



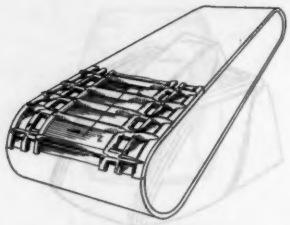
222,244
SNOWMOBILE COWL
Anthony MacKeen, Valcourt, Quebec, Canada, assignor to Bombardier Limited, Valcourt, Quebec, Canada
Filed Oct. 6, 1969, Ser. No. 19,423
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D14—24



222,245
SNOWMOBILE
Anthony MacKeen and Yves Anselme Lapointe, Valcourt, Quebec, Canada, assignors to Bombardier Limited, Valcourt, Quebec, Canada
Filed Oct. 6, 1969, Ser. No. 19,428
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D14—24

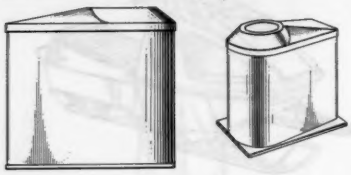
222,246
SNOWMOBILE
Anthony MacKeen and Yves Anselme Lapointe, Valcourt, Quebec, Canada, assignors to Bombardier Limited, Valcourt, Quebec, Canada
Filed Oct. 7, 1969, Ser. No. 19,449
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D14—24

222,247
SNOWMOBILE TRACK
Jules Perreault, Sherbrooke, Quebec, Canada, assignor to Bombardier Limited, Valcourt, Quebec, Canada
Filed Jan. 27, 1970, Ser. No. 21,112
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D14—24

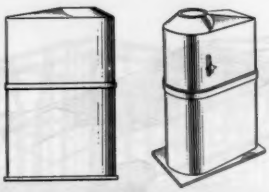


222,248
CHAIR FRAME
Gardner Leaver, New York, N.Y., assignor to Steelcase Inc., Grand Rapids, Mich.
Original design application Mar. 20, 1969, Ser. No. 16,351. Divided and this application May 7, 1970, Ser. No. 22,873
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D15—1

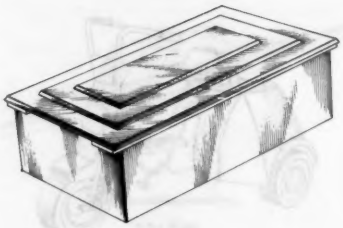
222,249
CHLORINATOR
Robert S. Lucas, Harbor City, Calif., assignor to Purex Corporation, Ltd., Lakewood, Calif.
Filed June 29, 1970, Ser. No. 23,722
Term of patent 14 years
Int. Cl. D24—*02*; D23—*01*
U.S. Cl. D16—2



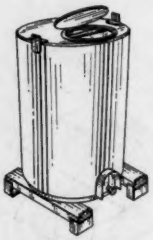
222,250
CHLORINATOR
Robert S. Lucas, Harbor City, Calif., assignor to Purex Corporation, Ltd., Lakewood, Calif.
Filed June 29, 1970, Ser. No. 23,723
Term of patent 14 years
Int. Cl. D24—*02*; D23—*01*
U.S. Cl. D16—2



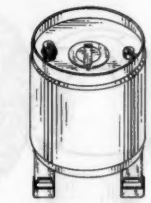
222,251
PET COFFIN
John W. Carson, Grand Rapids, Mich., assignor to Carson and Rogers Company, Springlake, Mich.
Filed July 13, 1970, Ser. No. 23,915
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D19—1



222,252
PORTABLE STORAGE BIN
Clarence B. Coleman and Harry R. Kattelmann, Oakland, Calif.; said Kattelmann assignor to Fabricated Metals
Filed May 21, 1970, Ser. No. 23,086
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2

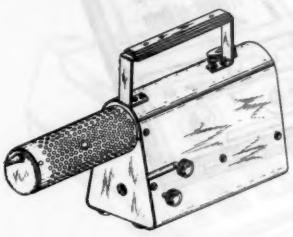


222,253
STORAGE BIN
Clarence B. Coleman and Harry R. Kattelmann, Oakland, Calif., assignors to Fabricated Metals, Inc.
Filed June 8, 1970, Ser. No. 23,372
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2

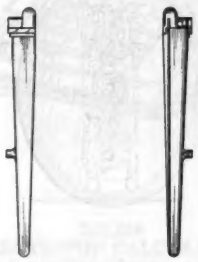


222,254
STORAGE CONTAINER
Harry R. Kattelmann, Oakland, and Guntis Lange, San Leandro, Calif., assignors to Fabricated Metals, Inc.
Filed Sept. 23, 1970, Ser. No. 25,160
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2

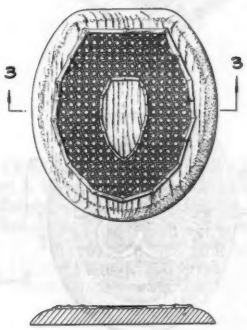
222,255
INSECTICIDAL JET FOGGING UNIT
Robert Schmedes, Rochester, and John M. Nelson, Webster, N.Y., assignors to Bernzomatic Corporation
Filed Sept. 12, 1969, Ser. No. 19,125
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18



222,256
SILENCER FOR FLUSHING CISTERNS
Herbert J. Moffatt, 16 Cary St., Manly, New South Wales, Australia
Filed May 14, 1969, Ser. No. 17,152
Claims priority, application Australia Dec. 18, 1968
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69



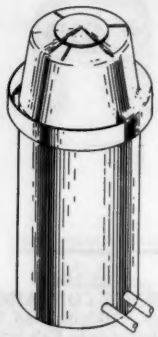
222,257
TOILET BOWL COVER
David E. Harrison, Columbus, Miss., assignor to Beneke Division, Beatrice Foods Co., Columbus, Miss.
Filed July 27, 1970, Ser. No. 24,163
Term of patent 3½ years
Int. Cl. D23—*02*
U.S. Cl. D23—71



222,258
TOILET BOWL COVER
David E. Harrison, Columbus, Miss., assignor to Beneke Division, Beatrice Foods Co., Columbus, Miss.
Filed July 27, 1970, Ser. No. 24,164
Term of patent 3½ years
Int. Cl. D23—*02*
U.S. Cl. D23—71

222,259
TOILET BOWL COVER
David E. Harrison, Columbus, Miss., assignor to Beneke Division, Beatrice Foods Co., Columbus, Miss.
Filed July 27, 1970, Ser. No. 24,165
Term of patent 3½ years
Int. Cl. D23—*02*
U.S. Cl. D23—71

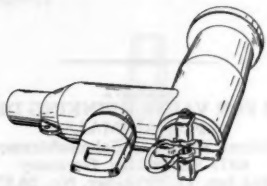
222,260
SWIMMING POOL HEATER OR THE LIKE
Richard H. Read and Alan H. Brown, San Diego, Calif., assignors to Hydronic Systems, Inc., San Diego, Calif.
Filed Jan. 8, 1970, Ser. No. 20,835
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—88



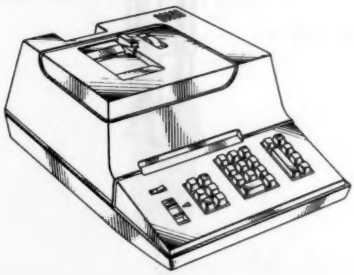
222,261
AUDIOMETER TEACHING DEVICE
Herbert N. Hartman, New York, and Samuel I. Berger, Brooklyn, N.Y., assignors to Biocoustics, Inc., Rockville, Md.
Filed June 29, 1970, Ser. No. 23,703
Term of patent 14 years
Int. Cl. D19—*08;* D14—*02*
U.S. Cl. D25—1

222,262
ELECTRICAL OUTLET SAFETY CAP
Elliot H. Hartford, 1048 Ramapo Valley Road, Mahwah, N.J. 07430
Filed July 27, 1970, Ser. No. 24,155
Term of patent 14 years
Int. Cl. D8—*99*; D13—*99*
U.S. Cl. D26—1

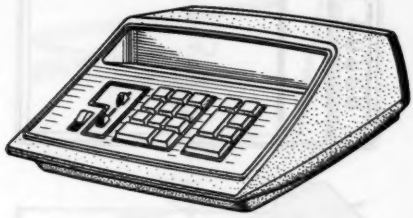
222,263
LOADBREAK CONNECTOR WITH PULLING EYE
Frederick Carl De Sio, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Aug. 11, 1970, Ser. No. 24,646
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1



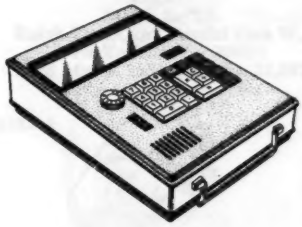
222,264
ELECTRONIC CALCULATOR
Hideki Ishii, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed June 15, 1970, Ser. No. 23,505
Term of patent 7 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



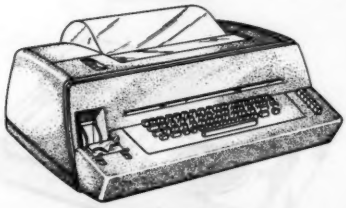
222,265
ELECTRONIC CALCULATING MACHINE
Katsuhiro Ishida and Yoshisaburo Yoshida, Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed July 1, 1970, Ser. No. 23,778
Claims priority, application Japan Jan. 21, 1970
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



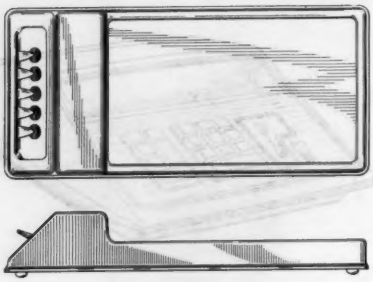
222,266
ELECTRONIC CALCULATOR
Takashi Morita, Sagamihara, Japan, assignor to Takachiho Koeki Kabushiki Kaisha, Osaka-shi, Japan
Filed July 13, 1970, Ser. No. 23,934
Claims priority, application Japan Jan. 14, 1970
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



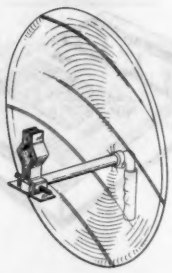
222,267
TELEPRINTER OR THE LIKE
Robert J. Ramig, Jr., Niles, Ill., assignor to Teletype Corporation, Skokie, Ill.
Filed Aug. 19, 1970, Ser. No. 24,585
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



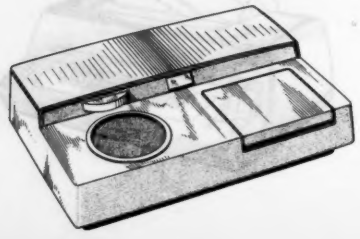
222,268
TELEPHONE CALL TRANSFERRING DEVICE
Lewis Fetzer, Dallas, Tex., assignor to David Wade Industries, Inc., Dallas, Tex.
Filed June 8, 1970, Ser. No. 23,349
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



222,269
PARABOLIC SOUND REFLECTING MICROPHONE HOLDER
Daniel Armstrong Gibson, Toronto, Ontario, Canada, assignor to Dan Gibson Productions Ltd., Toronto, Ontario, Canada
Filed June 12, 1970, Ser. No. 23,458
Claims priority, application Canada Apr. 9, 1970
Term of patent 7 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



222,270
COMMUNICATION APPARATUS
Donald Michael Genaro, Haworth, N.J., and Carl Paul McFadden, Federal Heights, Colo., assignors to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.
Filed July 16, 1970, Ser. No. 23,983
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



222,271
NIPPLE FOR VALVE DRINKING DEVICES FOR ANIMALS
Helmut Rader, 16 Bahnhofstrasse, 6079 Buchschlag, Germany
Filed Jan. 12, 1970, Ser. No. 20,869
Claims priority, application Germany Aug. 22, 1969
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

222,272
NIPPLE FOR VALVE DRINKING DEVICES FOR ANIMALS
Helmut Rader, 16 Bahnhofstrasse, 6079 Buchschlag, Germany
Filed Jan. 12, 1970, Ser. No. 20,870
Claims priority, application Germany Aug. 22, 1969
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

222,273
NIPPLE FOR VALVE DRINKING DEVICES FOR ANIMALS
Helmut Rader, 16 Bahnhofstrasse, 6079 Buchschlag, Germany
Filed Feb. 3, 1970, Ser. No. 21,243
Claims priority, application Germany Oct. 8, 1969
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

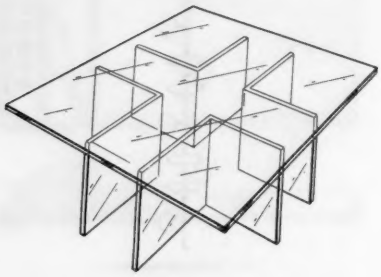
222,274
NIPPLE FOR VALVE DRINKING DEVICES FOR ANIMALS
Helmut Rader, 16 Bahnhofstrasse, 6079 Buchschlag, Germany
Filed Feb. 3, 1970, Ser. No. 21,245
Claims priority, application Germany Oct. 8, 1969
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

222,275
NIPPLE FOR VALVE DRINKING DEVICES FOR ANIMALS
Helmut Rader, 16 Bahnhofstrasse, D 6079 Buchschlag, Germany
Filed Feb. 3, 1970, Ser. No. 21,246
Claims priority, application Germany Oct. 8, 1967
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

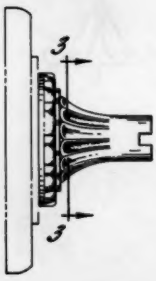
222,276
CAT LADDER
Alyn S. Hughes, Jr., 2524 Minnesota Ave., Metairie, La. 70003
Filed Sept. 11, 1970, Ser. No. 24,947
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—42

222,277
BOOT RACK
Ralph Kraus, 262 Central Park W., New York, N.Y. 10024
Filed May 8, 1970, Ser. No. 22,887
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—3

222,278
GLASS TABLE
Maria V. Thornhill, 11705 Longleaf, Houston, Tex. 77024
Filed Mar. 25, 1970, Ser. No. 22,058
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D33—14

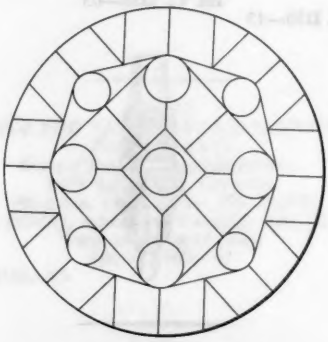


222,279
POST FOR SUPPORTING TOWEL RACKS, TOILET PAPER HOLDERS, AND OTHER HOUSEHOLD HARDWARE
La Verne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed May 25, 1970, Ser. No. 23,116
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D33—32

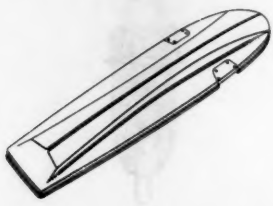


222,280
GOLF PUTTER HEAD
Raymon W. Cook, 1026 Mount Eden, San Antonio, Tex. 78213
Filed Feb. 3, 1970, Ser. No. 21,232
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

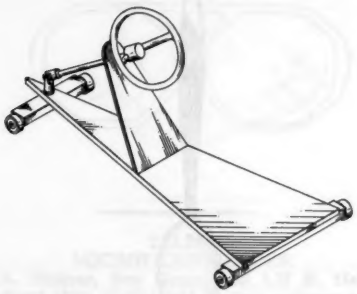
222,281
BOARD FOR A DART-TYPE GAME
John J. Feagans and Leo J. Jehle, both of 9431 Theodosia, St. Louis, Mo. 63114
Filed Mar. 27, 1970, Ser. No. 22,076
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



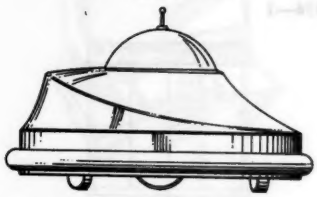
222,282
SNOW BOARD
Loran R. Hill, Olney, Ill., assignor to AMF Incorporated
Filed May 7, 1970, Ser. No. 22,870
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—15



222,283
CHILD'S COASTER VEHICLE
Robert G. Reeves, 106 Kinderway Ave., Charlotte, N.C. 28214
Filed July 15, 1970, Ser. No. 23,965
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

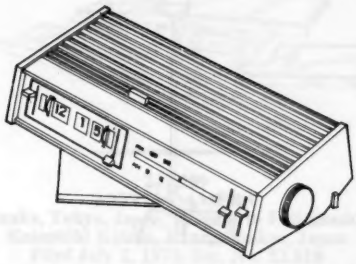


222,284
VEHICLE TOY
John Edward Walker, 7637 White Oak Ave., Reseda, Calif. 91335
Filed Aug. 28, 1970, Ser. No. 24,744
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

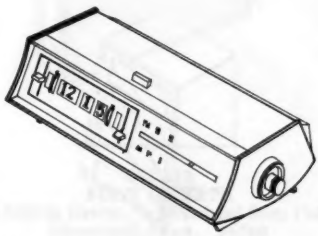


222,285
COMBINED CLOCK RADIO AND LAMP
Hachiro Masuda, Lodi, and Morris J. Feldman, North Caldwell, N.J., assignors to York Radio Corp., South Hackensack, N.J.
Filed Aug. 6, 1970, Ser. No. 24,342
Term of patent 14 years
Int. Cl. D26—*05;* D14—*03;* D10—*01*
U.S. Cl. D42—7

222,286
COMBINED CLOCK RADIO AND SWIVEL BASE THEREFOR
Hachiro Masuda, Lodi, and Morris J. Feldman, North Caldwell, N.J., assignors to York Radio Corp., South Hackensack, N.J.
Filed Aug. 6, 1970, Ser. No. 24,345
Term of patent 14 years
Int. Cl. D14—*03;* D10—*01*
U.S. Cl. D42—7



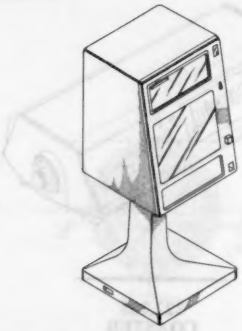
222,287
CLOCK RADIO
Hachiro Masuda, Lodi, and Morris J. Feldman, North Caldwell, N.J., assignors to York Radio Corp., South Hackensack, N.J.
Filed Aug. 6, 1970, Ser. No. 24,346
Term of patent 14 years
Int. Cl. D10—*01;* D14—*03*
U.S. Cl. D42—7



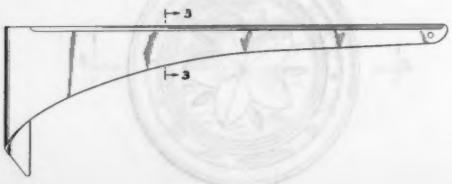
222,288
COASTER
Homer Gilliam, Jr., Box 937, Leesburg, Va. 22075
Filed July 24, 1970, Ser. No. 24,104
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—10

222,289
LIGHT FOR BICYCLES AND THE LIKE
Leon M. Banter, 12470 W. 31st Ave., Wheatridge, Colo. 80215; Neal P. Kempf, 6919 S. Bemis, Littleton, Colo. 80120; and Russell R. Randall, 410 Colorado Blvd., Denver, Colo. 80206
Filed Dec. 8, 1969, Ser. No. 20,412
Term of patent 14 years
Int. Cl. D26—*06;* D29—*02*
U.S. Cl. D48—24

222,290
VENDING MACHINE FOR NEWSPAPERS OR THE LIKE
Rune Pearson, Los Angeles County, Calif. (11645 McBean Drive, El Monte, Calif. 91732)
Filed Mar. 12, 1970, Ser. No. 21,870
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3

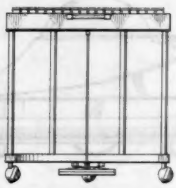


222,291
RULE
Palle Winston Seiersen, 158 Leibnitz, Mexico City, Mexico
Filed Apr. 22, 1970, Ser. No. 22,564
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6



222,292
SPOON OR THE LIKE
Raymond T. Cleeland, Freehold, N.J., assignor to American Home Products Corporation, New York, N.Y.
Filed Sept. 25, 1970, Ser. No. 25,191
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

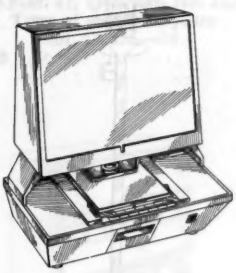
222,293
PORTABLE SET OF ORCHESTRA BELLS OR SIMILAR ARTICLE
Clair O. Musser, Studio City, Calif., assignor to CBS Musical Instruments, a division of Columbia Broadcasting Systems, Inc.
Filed Apr. 10, 1970, Ser. No. 22,372
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D56—1



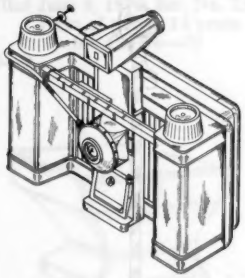
222,294
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Filed Aug. 31, 1970, Ser. No. 24,778
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1

222,295
SUNGLASS FRAME FRONT
Roger L. McCracken, Chili, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Mar. 30, 1970, Ser. No. 22,111
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1

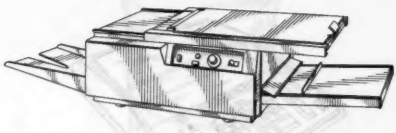
222,296
MICROFICHE READER
Louis A. Smitzer, San Diego, and Ulf R. Helgesson, Woodland Hills, Calif.; said Smitzer assignor to Micro Image Corporation, San Diego, Calif.
Filed Apr. 17, 1970, Ser. No. 22,476
Term of patent 14 years
Int. Cl. D16—*0*
U.S. Cl. D61—1



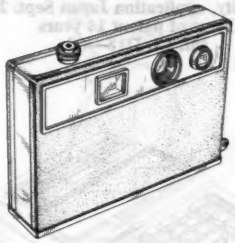
222,297
MULTIIMAGE CAMERA
Leslie R. Walstrom, Excelsior, Minn., assignor to Multi Photo Camera Corporation
Filed Apr. 24, 1970, Ser. No. 22,638
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1



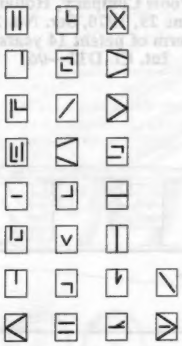
222,298
ELECTROSTATIC COPIER
Hideki Ishii, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed June 15, 1970, Ser. No. 23,504
Claims priority, application Japan, Dec. 27, 1969
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1



222,299
MOVIE CAMERA
Yoh Tanaka, Tokyo, Japan, assignor to Fuji Shashin Film Kabushiki Kaisha, Kanagawa-ken, Japan
Filed July 2, 1970, Ser. No. 23,818
Claims priority, application Japan Feb. 3, 1970
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1



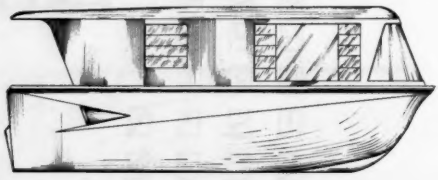
222,300
FONT OF TYPE
Kent Melvin Graves, % Moorhead State College, Moorhead, Minn. 56560
Filed Feb. 6, 1970, Ser. No. 21,306
Term of patent 7 years
Int. Cl. D18—*04*
U.S. Cl. D64—12



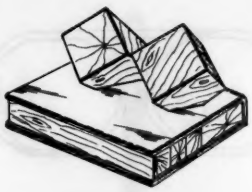
222,301
CALCULATING MACHINE
Mititaka Yamamoto, Kyoto-fu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto-fu, Japan
Filed June 29, 1970, Ser. No. 23,698
Claims priority, application Japan Dec. 29, 1969
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11

222,302
CALCULATING MACHINE
Mititaka Yamamoto, Kyoto-fu, Japan, assignor to Omron Tateisi Electronics Co., Ukyo-ku, Japan
Original design application Mar. 27, 1969, Ser. No. 16,478. Divided and this application July 8, 1970, Ser. No. 23,855
Claims priority, application Japan Sept. 29, 1968
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11

222,303
BOAT
Jay A. Lankheet, Holland, Mich., assignor to Glamour Pools Company, Holland, Mich.
Filed June 29, 1970, Ser. No. 23,740
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



222,304
CHANGEABLE CALENDAR
Michael J. Smith, % Arrow Art Finishers, Inc., 1201 Evergreen Ave., Bronx, N.Y. 10468
Filed June 15, 1970, Ser. No. 23,484
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D74—5

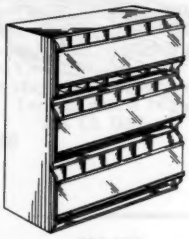


222,305
PENCIL
Perry Feuer, Roslyn, N.Y., assignor to Creative Creations, Inc., New York, N.Y.
Filed Sept. 23, 1970, Ser. No. 25,161
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—24

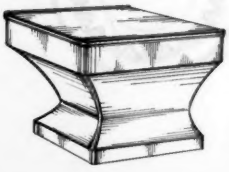
222,306
PENCIL
Perry Feuer, Roslyn, N.Y., assignor to Creative Creations, Inc., New York, N.Y.
Filed Sept. 23, 1970, Ser. No. 25,164
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—24

222,307
DISPLAY STAND FOR SUPPORTING STACKED CANDY BOXES
Amilcare Dogliotti, Neive (Cuneo), Italy, assignor to P. Ferrero & C. S.p.A., Alba (Cuneo), Italy
Filed Oct. 1, 1969, Ser. No. 19,360
Claims priority, application Germany Apr. 19, 1969
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—9

222,308
MERCHANDISE DISPLAY AND STORAGE STAND
Carl E. Lindgren, Rockford, John J. Racila, Chicago, and William Brunner, Wilmette, Ill., assignors to Amerock Corporation, Rockford, Ill.
Filed Mar. 11, 1970, Ser. No. 21,853
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D80—9

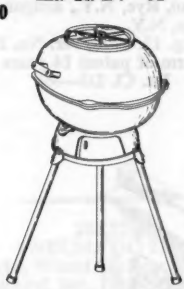


222,309
DISPLAY STAND
Donald H. Ellingson and Herbert L. Reynolds, Seattle, Wash., assignors to Reynolds Display-Fixtures Inc., Seattle, Wash.
Filed June 4, 1970, Ser. No. 23,319
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D80—9

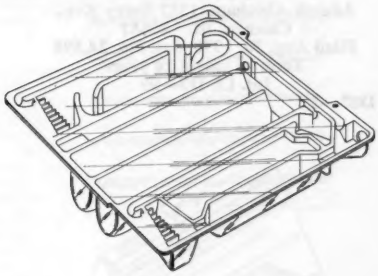


222,310
COMBINATION BARBECUE PIT, GRILL, BOILER AND OVEN
Malcolm A. Zaunbrecher, 1007 W. Texas Ave., Rayne, La. 76578
Filed Aug. 11, 1970, Ser. No. 24,428
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D81—10

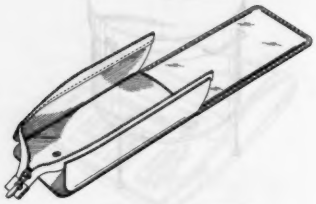
222,311
OUTDOOR COOKER
Judkins E. Wilkinson and Clarence R. Smith, Birmingham, Ala., assignors to Atlanta Stove Works, Inc.,
Filed Dec. 4, 1970, Ser. No. 26,288
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D81—10



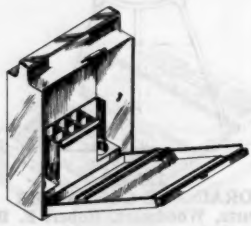
222,312
DRAINAGE CONTAINER
Leonard D. Kurtz, Woodmere, Robert E. Bidwell, Melville, Sidney Mishkin, Great Neck, and Edward J. Hallstein, Smithtown, N.Y., assignors to Deknatel, Inc., Queens Village, N.Y.
Filed Mar. 19, 1970, Ser. No. 21,965
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



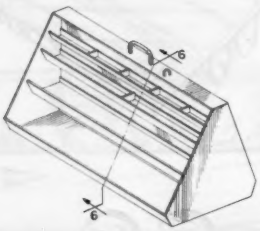
222,313
UMBRELLA CASING
Harry Mengel, Solingen, Germany, assignor to Kortenbach & Rauh Kommanditgesellschaft, Solingen-Weyer, Germany
Filed Aug. 12, 1969, Ser. No. 18,652
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



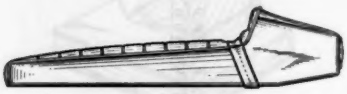
222,314
TOTE CASE FOR TABLEWARE OR THE LIKE
Martin A. Jaffe, Bronx, George S. Northrop, Wantagh, and Samuel Braun, Rye, N.Y., assignors to Cellu-Craft Inc., Lake Success, N.Y.
Filed Aug. 12, 1970, Ser. No. 24,442
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



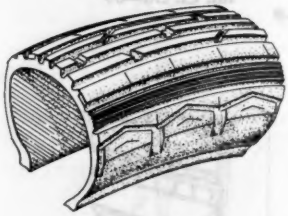
222,315
TOOL KIT
Adolph Abraham, 1357 Barry Ave., Chicago, Ill. 40657
Filed Aug. 20, 1970, Ser. No. 24,595
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



222,316
BICYCLE SEAT
Samuel Wilkens, 4 Leonard Drive, East Rockaway, N.Y. 11518
Filed Nov. 7, 1969, Ser. No. 19,984
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D90—16

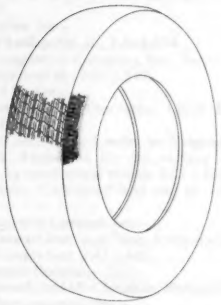


222,317
TIRE
Yoshio Oita, Tantakabayashi, Japan, assignor to Dunlop Holdings Limited, Birmingham, England
Filed Sept. 22, 1969, Ser. No. 19,233
Claims priority, application Japan Mar. 20, 1969
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20

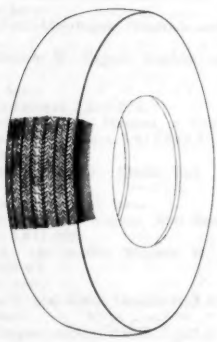


222,318
TIRE
Hamilton Carter Jamison, 14202 Burtcliff, Houston, Tex. 77037
Filed Feb. 6, 1970, Ser. No. 21,304
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20

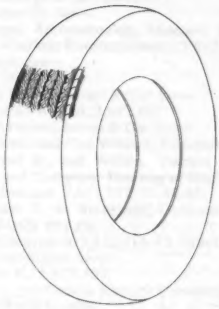
222,319
PNEUMATIC TIRE
Arthur C. Blankenship, Detroit, Mich., assignor to Uniroyal, Inc., New York, N.Y.
Filed Feb. 20, 1970, Ser. No. 21,537
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



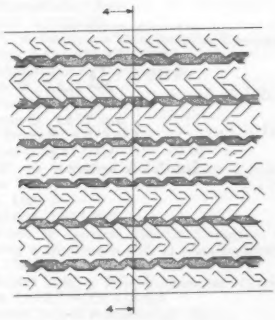
222,320
PNEUMATIC TIRE
Dale J. Beaudoin, Opelika, Ala., and William K. Pope, Mount Clemens, Mich., assignors to Uniroyal, Inc., New York, N.Y.
Filed May 18, 1970, Ser. No. 23,030
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



222,321
PNEUMATIC TIRE
Dale J. Beaudoin, Opelika, Ala., and William K. Pope, Mount Clemens, Mich., assignors to Uniroyal, Inc., New York, N.Y.
Filed July 2, 1970, Ser. No. 23,808
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



222,322
PNEUMATIC TIRE
William K. Pope, Mount Clemens, Mich., assignor to Uniroyal, Inc., New York, N.Y.
Filed July 20, 1970, Ser. No. 24,022
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF OCTOBER, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Copping, Bruce G., 3,612,495.
Sievenpiper, Ward, 3,612,538.

AB Broderna Kjellstrom: *See—*
Kjellstrom, Alvar Eskil Petrus; and Molin, Ake Einar Charles, 3,612,558.

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Strohl, Clair Laffayette, Jr., 3,612,474.

Abcor Water Management Company, Inc.: *See—*
Chappel, Raymond M., 3,611,547.

Abernathy, Lloyd E.: *See—*
Carroll, Cornelius F.; Abernathy, Lloyd E.; and Miller, Allen W.,3,612,029.

Abraham, Endre; and Tasfi, Laszlo, to Vizgazdalkodasi Tudomayos Kutato Intezet. Apparatus for the surface aeration of still and running waters by mechanical means. 3,612,489, Cl. 259-154.

Abramopaulos, John. Combined land and air vehicle. 3,612,441, Cl. 244-2.

Abrasive Developments Limited: *See—*
Ashworth, Stewart Ives; and Field, Anthony Gerard, 3,611,639.
Ashworth, Stewart Ives, 3,611,640.

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Cancilla, Edward; and McClanahan, Bernard E., 3,612,004.

ACF Industries, Incorporated: *See—*
Beishir, Richard B., 3,612,008.
Beishir, Richard Bert, 3,612,010.

Ackerman, Bernard, to Electro-Catheter Corporation. Catheter stylets. 3,612,058, Cl. 128-348.

Adaev, Evgeny Ivanovich; Blinov, Alexandr Vasilievich; and Novoselov, Viktor Alexandrovich. Sealing of current-carrying lead for electrode of electrolyzer. 3,612,751, Cl. 174-151.

Adair, Larry L. Web cutter. 3,611,856, Cl. 83-107.

Adamson United Company: *See—*
Trishman, Harry A., 3,611,496.

Addressograph-Multigraph Corporation: *See—*
Shelffo, Loren; and Mathisen, Henry A., 3,612,682.

Adickes, Cecil F.; and Bies, Gary D., to Tonka Corporation. Wheeled toy vehicle. 3,611,630, Cl. 46-201.

Admiral Corporation: *See—*
Jarosz, George J., 3,613,109.

Advance Valve Installations, Inc.: *See—*
Blazek, George A., 3,612,478.

AEG-Elotherm GmbH: *See—*
Von Starck, Axel, 3,612,720.

Aero Wash Services, Inc.: *See—*
Haase, Robert; and Tompkins, Robert, 3,612,353.

Aerojet-General Corporation: *See—*
Fisher, William E.; and Morrison, John A. H., 3,611,826.

Aeronca, Inc.: *See—*
Rathbun, Robert R., 3,612,387.

Aerpat A. G.: *See—*
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Tronnier, Albrecht W.; Eggert, Joachim; and Uberhagen, Fritz, 3,612,663.

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Ohman, Claes Thomas, 3,612,879.

Aga, Takashi; and Yamanaka, Masami, to Yamato Scale Company, Limited. Price counting balance. 3,612,842, Cl. 235-151.33

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Agfa-Gevaert Aktiengesellschaft: *See—*
von Albedyll, Joachim; Wagner, Karl Ottobrunn; and Huber, Hans-Peter, 3,611,895.

Aidlin, Samuel S.; and Aidlin, Stephen H. Separator-conveyor. 3,612,272, Cl. 209-92.

Aidlin, Stephen H.: *See—*
Aidlin, Samuel S.; and Aidlin, Stephen H.,3,612,272.

Aikoh Co., Ltd.: *See—*
Matsuyama, Shigeru; and Ito, Yukio, 3,612,155.

Air Cushion Vehicles, Inc.: *See—*
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Air Logistics Corporation: *See—*
Buckley, David L., 3,611,864.

Air Preheater Company, Inc., The: *See—*
Ostrander, George K., 3,612,293.

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Akatsu, Mitsuharu; Yoneyama, Takao; and Iwasaki, Tadahiko, to Hitachi, Ltd. Beam current limiting circuit for a cathode-ray tube. 3,612,756, Cl. 178-5.4

Akiyama, Hideaki: *See—*
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Aksenov, Ivan Ivanovich: *See—*
Smirnov, Sergei Alexandrovich; Aksenov, Ivan Ivanovich; and Bocharov, Vladimir Konstantinovich,3,612,937.

Aktiebolaget Kamyr: *See—*
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Aktiengesellschaft Brown, Boveri & Cie: *See—*
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Aktiengesellschaft Frown, Boveri & Cie: *See—*
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Alaburda, Raymond D.; and Waldin, Vincent H., to Du Pont de Nemours, E. I., and Company. Freezing of fragile foodstuffs with an ebullient liquid freezant. 3,611,737, Cl. 62-63.

Albrecht, Alexander J., to Brunswick Corporation. One-revolution clutch. 3,612,234, Cl. 192-28.

Albright, Alva Z. Chain saws. 3,612,115, Cl. 143-32.

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Allen, Arthur Frederick, to Rolls-Royce Limited. Vehicle wheel suspension. 3,612,204, Cl. 180-43.

Allen, Walter R. Continuous hydraulic ore hoisting system. 3,612,615, Cl. 302-14.

Allen-Bradley Company: *See—*
Kosem, Marion; and Hohberger, Clive P., 3,612,841.

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Allied Products Corporation: *See—*
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Altmanshofer, Robert Dale, to RCA Corporation. Color temperature control circuits. 3,612,754, Cl. 178-5.4

Aluminum Converter Sales & Research Inc.: *See—*
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Amelkin, Anatoly Kuzmich; Nikolaev, Nikolai Sergeevich; and Sergeev, Mikhail Mikhailovich. Dew-point hygrometer. 3,611,788, Cl. 73-17.

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American Greeting Corporation: *See—*
Nervig, Charles H., 3,612,292.
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American Hospital Supply Corporation: *See—*
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Amsden, Donald L.; and Nowicki, Casimir W., to Owens-Illinois, Inc. Container making apparatus control system. 3,611,483, Cl. 18-5.
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Anderson, Andrew W., to Scandia Packaging Machinery Company. Web feeding means and method. 3,611,882, Cl. 93-1.
Anderson, Earl R., to Brex Corporation, trustee. Shuffle feed mechanism. 3,612,269, Cl. 209-73.
Anderson, George Edward, to RCA Corporation. Color television kinescope set-up apparatus. 3,612,757, Cl. 178-5.4
Anderson, Harold P.; Becker, Floyd K.; Berryman, Robert D.; Botsford, Nelson, Jr.; Hoffman, Maurice A.; and Ryan, Arthur P., III, to Bell Telephone Laboratories, Incorporated. Equipment for selectively establishing audio and wideband communication paths through two autonomous switching systems. 3,612,767, Cl. 179-2.
Anderson, James L.; Cloughly, Ernest M.; and Smith, Charles I., to Jackson, Byron, Inc. Method of stimulating well production. 3,612,179, Cl. 166-281.
Anderson, Norman J., to Zurn Industries, Inc. Detent mechanism for disconnect coupling. 3,612,583, Cl. 287-104.
Anderson, Thomas F.; Gunderman, Glen L.; and Walters, Harold A., to Dow Chemical Company, The. Method for expanding and drying expandable microspheres. 3,611,583, Cl. 34-9.
Andreini, John; Borchard, Edwin Harley; Pohl, Karl-Heinz; and Puccio, Joseph Anthony, to Bell Telephone Laboratories, Incorporated. Quick-mounting hardware. 3,612,590, Cl. 292-76.
Andresen, John H., Jr., to Intercontinental Dynamics Corporation. Drive means for pointer of aircraft instrument. 3,611,810, Cl. 73-397.
Andrews, Boley A.; and Ptacek, James F., to Vendo Company, The. Combined optical and magnetic transducer. 3,612,835, Cl. 235-61.11
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Andrey, Michel, to Automobiles Peugeot. Device for mounting an embellishing element around a fixed window of a vehicle. 3,611,663, Cl. 52-397.
Angele, Wilhelm; and Kennedy, Bobby W., to United States of America, National Aeronautics and Space Administration. Shielded flat cable. 3,612,743, Cl. 174-36.
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Angold, Raymond H. Coating machine. 3,611,984, Cl. 118-19.
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Stromquist, Michael E., 3,612,821.
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Heximer, Donald G.; Sullivan, Walter D.; Heximer, Donald G.; and Sullivan, Walter D., 3,611,946.

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Cunningham, Eugene H., deceased (by Cunningham, Ruby, administratrix); and Langill, Edward G., to Green Giant Company. Food coring apparatus. 3,612,124, Cl. 146-52.

Curtis, Thomas E.; Popeck, Charles A.; and Beard, Lloyd R., to Chance, A. B., Company. High voltage power vacuum fuse. 3,613,039, Cl. 337-278.

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Daly, Nelson B., deceased (by Daly, Evelyn Silvers, executrix); Gilbert, Walter W.; and Nacci, George R., to Du Pont de Nemours, E. I., and Company. Copying magnetic signals by thermoremanent transfer. 3,613,102, Cl. 346-74.

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Davis, Mike, to Dresser Industries, Inc. Multiple chamber earth formation fluid sampler. 3,611,799, Cl. 73-155.

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Desbrandes, Robert; Lebreton, Francisque; and Morlier, Pierre, to Institut Francais du Petrole des Carburants et Lubuifiants. Method and apparatus to effect substantially point-wise measurements of the characteristics of the ground layers traversed by bore hole. 3,613,072, Cl. 340-18.

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Dixon, Robert L., to Smith International, Inc. Rock boring cutter. 3,612,196, Cl. 175-364.
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Domonkos, Joseph. Eating utensil for string-like foods. 3,611,849, Cl. 83-23.
Doniguian, Thaddeus M.; and Kipps, Harry J., to Signal Oil and Gas Company. Pulsed cathodic protection apparatus and method. 3,612,898, Cl. 307-95.
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Strong, Richard A. Warp action spoiler plate aileron and combined airplane and automobile. 3,612,440, Cl. 244-2.

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Swenson, Eskil W., to Swenson Spreader & Mfg., Co. Rotary lawnmower attachment. 3,611,683, Cl. 56-16.1

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Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Method for continuously producing a slide fastener chain. 3,611,545, Cl. 29-408.

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Tenney, William L. Two cycle rear compression engine parking and transfer passage arrangement. 3,612,014, Cl. 123-73.

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Thomas, Michael D. Pill dispenser with disposable magazine and indica. 3,612,348, Cl. 221-2.

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Thomas, Orrin H. Battery terminal connector. 3,613,053, Cl. 339-231.

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Tichenor, Lawrence B. Mouthpiece for musical instruments. 3,611,860, Cl. 84-398.

Tiepel, Robert Ernst Carl Herbert, to Lever Brothers Company. Apparatus for the treatment of vegetables. 3,612,275, Cl. 209-152.

Timko, Charles A.; and Oberhofer, Lanny A., to Continental Can Company, Inc. Random jar coder. 3,611,920, Cl. 101-35.

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Timms, Richard H.; and Holman, Leonard,, to Rohr Corporation. Trust controlling apparatus with variable axial flow area for differing flight regimes and thrust reversal. 3,612,402, Cl. 239-265.29

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Tissier, Roger Henri, to Societe Nationale d'Etude et de Construction de Moteurs d' Aviation. Device for programming the throughput of fuel supplied to a combustion chamber during an ignition or reignition phase. 3,611,717, Cl. 60-39.28

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